EXABYTE EZ17M AND EZ17A AUTOLOADER

INSTALLATION AND OPERATION

328824-004

Exabyte®

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Note: The most current information about this product is available at Exabyte's World Wide Web site (www.exabyte.com).

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328824-004

Revision History

Revision	Date	Description
000	August 1998	Beta release.
001	August 1998	Initial release.
002	March 1999	Added information about the LVD SCSI configuration and Exabyte Mammoth-LT.
003	January 2000	Added Exabyte Mammoth-2 tape drive information.
004	June 2001	Removed section on replacing the fuse and added AIT information.

Safety Agency Standards

The Exabyte EZ17M and EZ17A complies with the following domestic and international product safety standards:

- UL Standard 1950, 3rd Edition, Information Technology Equipment including Electrical Business Equipment
- CSA Standard C22.2 No. 950-95, Safety of Information Technology Equipment including Electrical Business Equipment
- IEC 950/EN60950, Safety of Information Technology Equipment including Electrical Business Equipment

FCC Notice

This equipment has been tested and found to comply with the limits for a digital device, pursuant to 47CFR, Part 15, Subpart B, Class B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential, commercial, or light-industrial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications.

Shielded cables are required for this device to comply with FCC Rules. Use shielded cables when connecting this device to others.

Industry Canadian Notice per ICES-003

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

French Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union

This equipment complies with the following standards:

- EN55022/CISPR22 Class B
- EN50082-1:1997 or EN55024:1998

Bureau of Standards, Metrology, and Inspection (BSMI) – Taiwan

This equipment has been tested and complies with BSMI CNS 13438 Class B.

Australia/New Zealand

This equipment has been tested and complies with AS/NZS 3548.

Product Warranty Caution

The Exabyte® EZ17M or EZ17A Autoloader (EZ17) is warranted to be free from defects in materials, parts, and workmanship and will conform to the current product specification upon delivery. For the specific details of your warranty, refer to your sales contract or contact the company from which the autoloader was purchased.

The warranty for the autoloader shall not apply to failures of any unit when:

- The autoloader is repaired by anyone other than the Exabyte's personnel or approved agent.
- The autoloader is physically abused or is used in a manner that is inconsistent with the operating instructions or product specification defined by Exabyte.
- The autoloader fails because of accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, modification, or service by anyone other than the factory service center or its approved agent.
- The autoloader is repaired by anyone, including an approved agent, in a manner that is contrary to the maintenance or installation instructions supplied by Exabyte.
- Exabyte's serial number tag is removed.
- The autoloader is damaged because of improper packaging on return.

CAUTION

Returning the autoloader in unauthorized packaging may damage the unit and void the warranty.

If problems with the autoloader occur, contact your maintenance organization; do not void the product warranty by allowing untrained or unauthorized personnel to attempt repairs.

Notes

Contents

How to use this manual

This manual describes how to install, configure, operate, maintain, and troubleshoot the Exabyte EZ17M and EZ17A autoloader.

Note: This manual uses "EZ17" to refer to either the EZ17M or EZ17A.

First-time installation

If you are installing the autoloader for the first time, refer to the following chapters:

- Chapter 1 provides an overview of the autoloader's features and components. Appendix A lists additional autoloader and drive specifications.
- Chapter 2 provides instructions for installing the autoloader hardware, connecting the autoloader to the SCSI bus, and powering on the autoloader. Appendix B provides additional information about SCSI configurations.
- Chapter 3 describes how to configure the autoloader for operation on the SCSI bus and for operation with your application software. Follow the steps at the end of this chapter to verify the setup and to begin autoloader operation.

Operation

During normal autoloader operations, you do not need to intervene in cartridge processing. However, you may need to refer to these chapters for some occasional tasks.

- Chapter 4 describes how to replace the magazine, how to store cartridges, how to operate the autoloader in Sequential mode, and how to view autoloader information. It also describes how to perform hardware exercises and how to reset the autoloader.

- Chapter 5 describes how clean and reset the drive, and how to display information about the drive. It also provides information about how to monitor the drive LEDs and how to manually eject a cartridge.

Troubleshooting and service

Refer to these chapters for troubleshooting and service:

- Chapter 6 describes how to use the Console firmware to perform a diagnostic listing, update the firmware, and view the LCD password.

- Chapter 7 describes basic troubleshooting recommendations.

- Chapter 8 describes basic maintenance and how to return the autoloader for service, if necessary.

- Appendix C lists the error codes displayed on the autoloader's LCD and provides information about resolving various error conditions.

Note: For the most current information about this product, visit Exabyte's web site (www.exabyte.com).

Related publications

Exabyte EZ17 Autoloader

- *Exabyte EZ17 Autoloader SCSI Reference*, 328823
- *Exabyte EZ17 MammothTape Technology Autoloader Product Specification*, 328822
- *Exabyte EZ17A AIT-2 Autoloader Product Specification*, 1008278

Exabyte Mammoth-2 Tape Drive

- *Exabyte Mammoth-2 Tape Drive SCSI Reference*, 330876
- *Exabyte Mammoth-2 Tape Drive Product Specification*, 330874
- *Exabyte Mammoth-2 Tape Drive Installation and Operation*, 330875

Exabyte Mammoth Tape Drive

- *Exabyte Mammoth Tape Drive Product Specification*, 306482
- *Exabyte Mammoth Tape Drive SCSI Reference*, 306483
- *Exabyte Mammoth Tape Drive Installation and Operation*, 306484

Exabyte Mammoth-LT Tape Drive

- *Exabyte Mammoth-LT Tape Drive Product Specification*, 340230
- *Exabyte Mammoth-LT Tape Drive Installation and Operation*, 326984

Sony SDX-500C AIT-2 Tape Drive

To locate documentation for the Sony SDX-500C AIT-2 tape drive, visit the Sony web site:

www.storagebysony.com/support/consumer.asp

Standards

- *ANSI Small Computer System Interface* (SCSI-2), X3.131-1994
- *ANSI Helical-Scan Digital Computer Tape Cartridge*, X3B5/89-136, Rev. 6
- *ANSI SCSI-3 Fast20 Parallel Interface (Fast-20*), X3.277 – 1996
- *ANSI SCSI Parallel Interface-2 (SPI-2*), X3T10/1142D, Rev. 11
- Standard ECMA-249, *8mm Wide Magnetic Tape Cartridge for Information Interchange – Helical Scan Recording – DA-2 Format*, June 1998
- Standard ECMA-293, *8mm Wide Magnetic Tape Cartridge for Information Interchange – Helical Scan Recording – MammothTape-2 Format*, December, 1999

- *TapeAlert Specificatio*n, Version 2.0, November, 1997
- IEEE 802.3 *Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications,* 1985
- EIA *Rack Standards,* RS-310-B

Conventions used in this manual

This manual uses the following conventions:

Enter Boxed text indicates keys on the operator panel.

Note: Notes provide additional information.

➤ **Important** Information next to the word "Important" helps you complete a procedure or avoid extra steps.

CAUTION

Boxed text under the word "CAUTION" provides information you must know to avoid damaging the autoloader or tape drive or losing data.

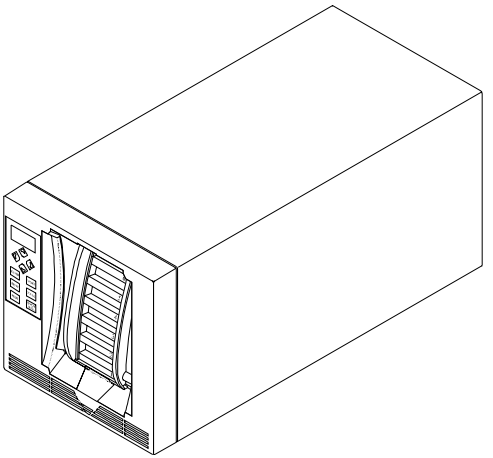
WARNING!

Boxed text under the heading “WARNING!” provides information you must know to avoid personal injury.

1 Product Overview

Congratulations on selecting the Exabyte® EZ17M autoloader with a MammothTape drive or an Exabyte EZ17A autoloader with an AIT-2 tape drive. Your new autoloader provides unattended data storage, archiving, backup, and retrieval for small PC workgroups to multi-server networks. The autoloader's robot automatically loads and removes cartridges from the enclosed drive.

The EZ17M or EZ17A autoloader (EZ17), shown in the following figure, is designed as a standalone unit. If you want to mount the autoloader in a rack, you can purchase a rack-mount kit from Exabyte (see "Contacting Exabyte"on the inside back cover).



About the Exabyte EZ17 Autoloader

The autoloader includes one data cartridge magazine and one of the following factory-installed tape drives:

- Exabyte Mammoth-2 (M2™)
- Exabyte Mammoth
- Exabyte Mammoth-LT
- Sony SDX-500C AIT-2

The autoloader is available in the following wide SCSI configurations:

- Single-ended (SE)
- Low-voltage differential (LVD)
- High-voltage differential (HVD)

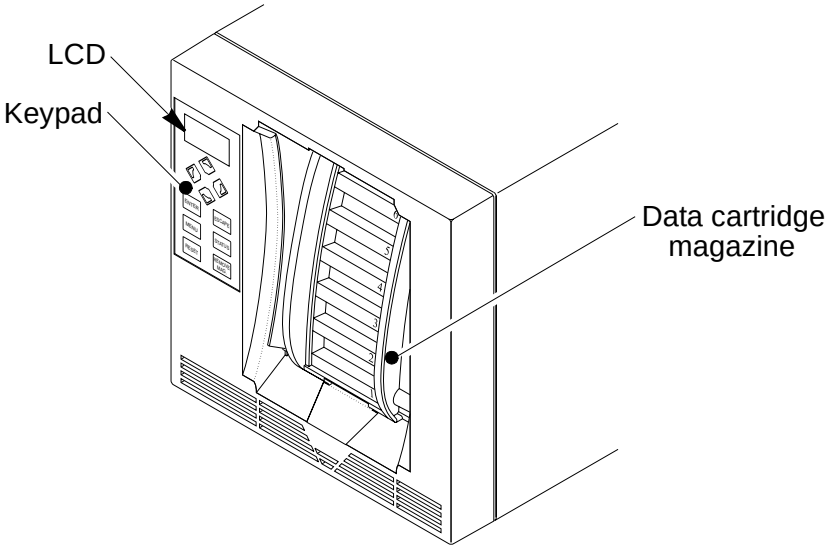
Note: The M2 and AIT-2 drives are only available with LVD.

The autoloader typically operates as two SCSI devices (the drive and the autoloader) on one wide SCSI bus. Mammoth and Mammoth-LT are SCSI-2 devices. Mammoth-2 and AIT-2 are Ultra2 LVD SCSI devices. If you want to install the autoloader on a narrow SCSI bus, you need to use an adapter.

Autoloader components

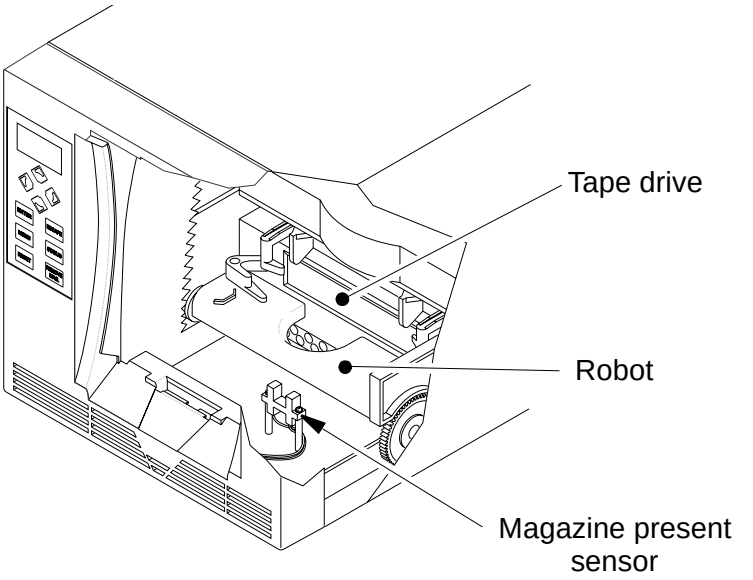
This section provides an introduction to the physical components of your autoloader.

Front panel components



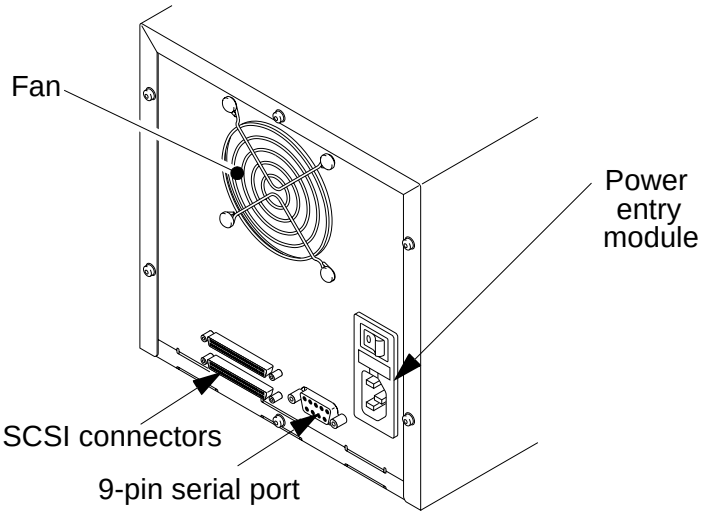
- **LCD and keypad (operator panel).** The two-line LCD (liquid crystal display) and keypad allow you to view the operational status of the autoloader, access a menu of operations, and view status messages.
- **Data cartridge magazine.** The autoloader includes one removable magazine that stores up to seven cartridges.

Internal components



- **Robot.** The robot moves a cartridge between the magazine and the drive.
- **Magazine present sensor.** The magazine present sensor detects whether a magazine is installed.
- **Tape drive.** The autoloader contains one drive.

Back panel components



- **Fan**. The fan reduces the autoloader's operating temperature.
- **Power entry module.** The power entry module includes the AC power connector and the power switch.
- **9-pin serial port.** The serial port allows you to connect a serial cable to the autoloader and use a terminal emulation program to perform diagnostics.
- **SCSI connectors.** The two wide SCSI connectors allow you to connect the autoloader to a wide SCSI bus. If desired, you can connect the autoloader to a narrow SCSI bus using the appropriate SCSI cable adapter.

Notes

2 Hardware Installation

This chapter describes how to install and set up your autoloader, which includes the following steps:

- Unpacking the autoloader
- Obtaining accessories and equipment
- Preparing the autoloader for installation
- Preparing and installing cartridges
- Connecting the autoloader to the SCSI bus
- Connecting the power cord
- Powering on the autoloader
- Verifying the hardware installation

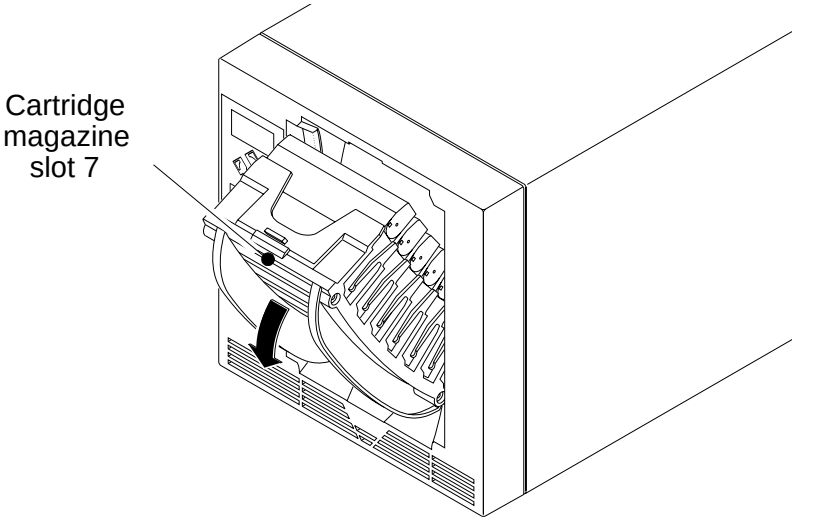
Unpacking the autoloader

To unpack the autoloader, remove the packing material and lift the autoloader out of the box.

Note: Save all the original packing materials, including the accessory box, in case you need to ship or move the autoloader later.

To remove the shipping braces:

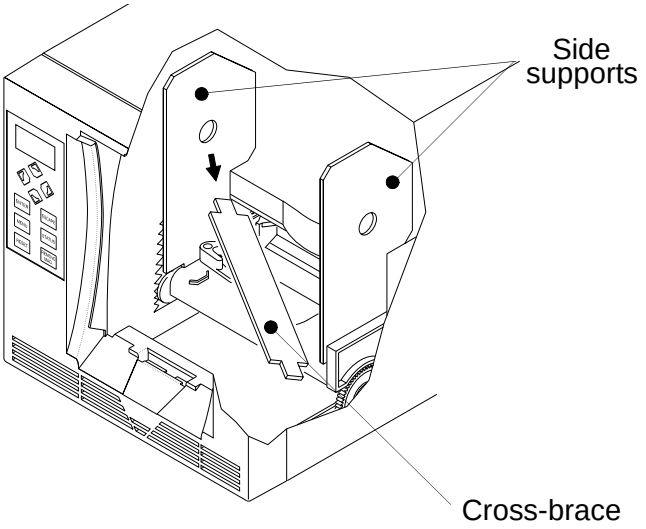
1. Remove the magazine by grasping it at the top (near cartridge slot 7) and pulling out, as shown in the following figure.



2. Remove the shipping brace:

a. Grasp the cross-brace and disengage it from one side support. Then remove it from the autoloader, as shown in the following figure.

b. Pull both of the side supports out of the autoloader.



Obtaining accessories and equipment

The autoloader is equipped with a 120 VAC power cord (see page 124 for power cord requirements for other voltages and international use) and one magazine. The following table shows the additional accessories and equipment needed for autoloader operation. Depending on the configuration you ordered, you may receive some of these items in your accessory box.

Required accessories and equipment[a]	
Data cartridges	One or more data cartridges may be included in the accessory box.
Cleaning cartridge	One cleaning cartridge may be included in the accessory box.[b]
SCSI cables	One wide, multi-mode (single-ended/LVD) or HVD SCSI cable may be included in the accessory box. If you want to use your own cables, see Appendix A for specifications.
SCSI terminators	One wide, multi-mode (single-ended/LVD) or HVD SCSI terminator may be included in the accessory box.
SCSI cable adapters (if you want to connect the autoloader to a narrow host)	See Appendix A for specifications. All Exabyte adapters terminate unused data lines.
Rack-mount hardware (if you want to install the autoloader in a rack)	A rack-mount hardware kit is available from Exabyte (see "Contacting Exabyte" on the inside back cover).

[a] Contact Exabyte to purchase these items (see "Contacting Exabyte" on the inside of the back cover).

[b] The EZ17 with Mammoth-2 or AIT-2 does not include a cleaning cartridge.

Selecting cartridges

The autoloader is available with four different drives. Each drive has its own media requirements.

> **CAUTION**
>
> Never use video-grade tape for data storage. Video-grade tape can be less accurate than data-grade tape and is more abrasive to tape drive recording heads.

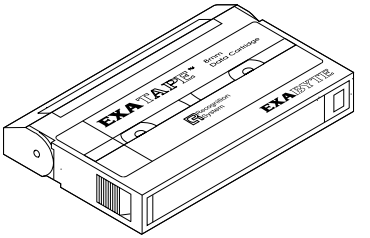
Refer to the appropriate section below for either Exabyte Mammoth, Mammoth-LT, and M2 drives or Sony SDX-500C AIT-2 drives.

➤ **Important** Because of media management and application software issues, Exabyte recommends that you do not mix AME with SmartClean, AME, AIT-2, or MP data cartridges in the same autoloader. If you must mix cartridge types, contact your application software vendor for assistance.

Exabyte Mammoth and Mammoth-LT tape drives

Mammoth and Mammoth-LT read and write data to standard Exabyte AME data cartridges, shown in the following figure. These drives cannot read or write to AME with SmartClean cartridges or AIT cartridges. Standard AME cartridges are available from Exabyte in lengths of 22 meters, 45 meters, 125 meters, and 170 meters.

Note: Mammoth-LT does not support the AME 170m cartridge. If you try to insert an Exabyte AME 170m cartridge in Mammoth-LT, the tape drive automatically ejects it.



Exabyte M2 tape drives

Exabyte M2 drives read and write to AME cartridges with SmartClean™ technology, combining reliable AME recording media with a short segment of head cleaning material. When the M2 drive determines cleaning is needed, it locates the cleaning material and performs the cleaning automatically. AME cartridges with SmartClean are easily identified by their cobalt-blue color and are available from Exabyte in lengths of 75 meters, 150 meters, and 225 meters (see page 121 for storage capacities).

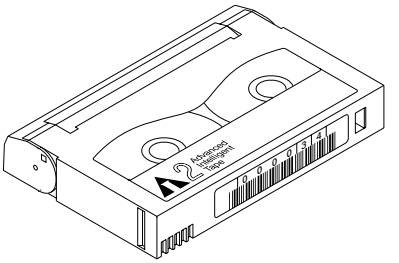
➤ **Important** For optimal performance and reliability, Exabyte recommends only AME media with SmartClean for M2 tape drives. M2 can use other AME media, but will require regular cleaning with an Exabyte Mammoth cleaning cartridge.

The M2 drive cannot write data to or read data from metal particle (MP) tape. If you insert an MP cartridge, the drive immediately ejects it .

Note: M2 does not support AIT cartridges. If you try to insert an AIT cartridge, the drive automatically ejects it.

Sony AIT-2 tape drives

Sony SDX-500C AIT-2 drives write to the highly reliable AME cartridges for AIT-1 and AIT-2 drives, available in lengths of 230 meters and 170 meters. The Sony SDX-500C drive automatically ejects cartridges it does not support, such as AME with SmartClean cartridges.



Note: Although the AIT cartridges include Memory in Cassette (MIC) capability, the library does not currently support this feature.

➤ **Important** Using AIT-1 cartridges in an AIT-2 drive will affect the overall performance of the drive. To ensure maximum transfer rates and capacity, use 230m AIT-2 cartridges.

Selecting cleaning cartridges

To select cleaning cartridges for your library, refer to the appropriate section below for either Exabyte Mammoth, Mammoth-LT, and M2 drives or Sony SDX-500C AIT-2 drives.

CAUTION

Using cloth swabs, cotton swabs, cleaning agents, or cleaning cartridges not approved for your drive may void the tape drive warranty.

Exabyte Mammoth and Mammoth-LT tape drives

Use an Exabyte Mammoth Cleaning Cartridge or a cleaning cartridge approved by Exabyte.

Exabyte M2 tape drives

If you do not use AME media with SmartClean exclusively, the M2 drive will require regular cleaning with a separate cleaning cartridge. Use an Exabyte Mammoth Cleaning Cartridge or a cleaning cartridge approved by Exabyte.

Sony AIT-2 tape drives

The Sony SDX-500C AIT-2 tape drives do not require periodic cleaning with a separate cleaning cartridge. However, under extreme environmental conditions, you may need to use an AIT cleaning cartridge, available from Exabyte.

Selecting application software

Make certain the application software you plan to use is compatible with the autoloader. You can obtain software compatibility information about Exabyte products from Exabyte's web site (www.exabyte.com).

Note: If your application only supports an Exabyte or Sony tape drive and not the EZ17 autoloader, you can run the autoloader in Sequential mode (see page 38 and page 53). If your application does not support the Exabyte EZ17, but does support the Exabyte 210 library, you can run the autoloader in 210 Emulation mode (see page 36).

You can install the application software on the host computer before or after autoloader installation. However, if you install the software first, you may need to reconfigure it for use with the autoloader.

Preparing the autoloader for installation

Before you begin hardware installation, do the following:

- Make certain the SCSI host bus adapter card installed in the host computer and the application software are compatible with the autoloader. Software compatibility information is available from www.exabyte.com.

- Ensure that the work area is free from conditions that could cause electrostatic discharge (ESD). Discharge static electricity from your body by touching a known grounded surface, such as your computer's metal chassis.

- Locate an appropriate area for the autoloader. The autoloader must have a level surface near a readily accessible outlet. In addition, there must be approximately 15 cm (6 inches) of open area behind the autoloader for adequate air flow.

- As an option, you can install the autoloader into a rack by contacting Exabyte for a rack-mount kit, which includes hardware and installation instructions. See "Contacting Exabyte" on the inside back cover.

WARNING!

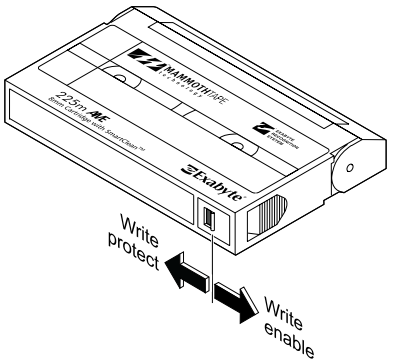
Before performing any installation or maintenance procedures, be sure that the autoloader power switch is in the off position and that the power cord is disconnected from the autoloader and the outlet.

Preparing and installing cartridges

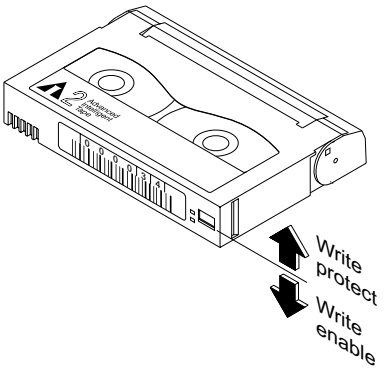
This section describes how to prepare cartridges for use in the autoloader and install cartridges in the magazine. For detailed information about selecting the appropriate cartridges to use with your autoloader, see "Selecting cartridges" on page 11.

To prepare and install cartridges:

1. Verify that the write-protect switches on the cartridges are set correctly, as shown in the following figure. You can use a ball-point pen or similar instrument to set the write-protect switch.



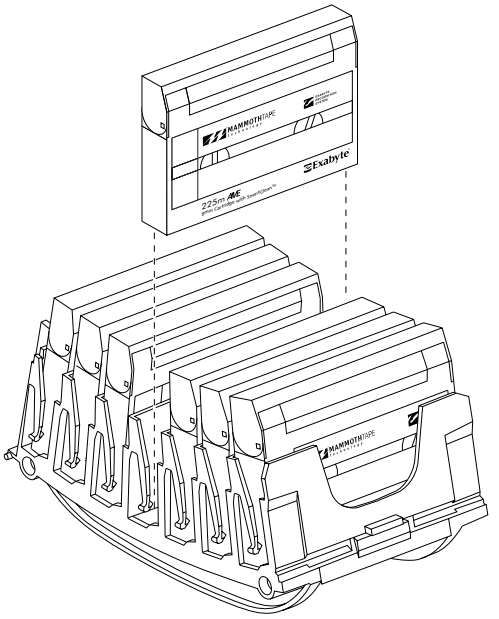
Write-protect switch on the M2 cartridge



Write-protect switch on the AIT-2 cartridge

2. Remove the magazine as described on page 8, if necessary.

3. Place the magazine on its back with the cartridge slots facing up and orient the cartridge as shown in the following figure.



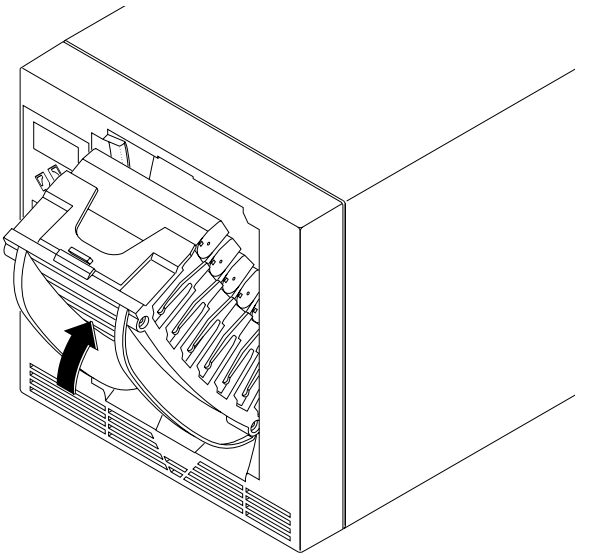
4. Insert a cartridge into each slot.

> **CAUTION**
>
> Avoid touching or opening the cartridge dust cover when handling the cartridge.
>
> Make sure the cartridge is inserted as shown in the figure above, or you may damage the magazine when you place it into the autoloader.

5. Position the magazine so the bottom mounting guide on the magazine (near cartridge slot 1) aligns with the slot in the bottom of the opening in the autoloader.

6. Push the top of the magazine in toward the autoloader until it snaps into place, as shown in the figure below.

> **CAUTION**
>
> Do not force the magazine into the autoloader. Forcing the magazine may break the cartridge slot fingers.



Connecting the autoloader to the SCSI bus

This section provides general guidelines for connecting the autoloader to the SCSI bus. The autoloader and drive operate as two SCSI devices on one wide SCSI bus. The autoloader can be connected to a narrow SCSI bus using the appropriate SCSI cable adapter (see Appendix A).

➤ **Important** The drive is a wide SCSI device. Attaching it to a narrow SCSI bus will significantly reduce its performance.

Before you begin connecting the autoloader to the SCSI bus:

- Read Appendix B, which provides an overview of the SCSI interface and some general guidelines for connecting the autoloader to the SCSI bus.
- Make sure the host computer and any peripheral devices are powered off.

CAUTION

To avoid damaging the drive, make sure the autoloader is powered off when you connect it to the SCSI bus.

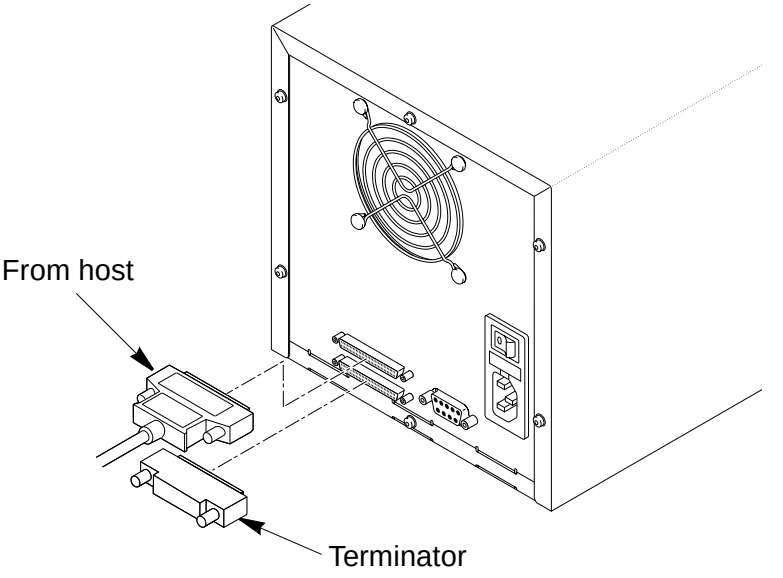
- Be aware that you can connect single-ended and LVD SCSI devices to the same SCSI bus. Mixing the two types of devices results in all devices on the bus operating as single-ended devices. The EZ17 with M2 or AIT-2 is LVD only.

To connect the autoloader to the SCSI bus:

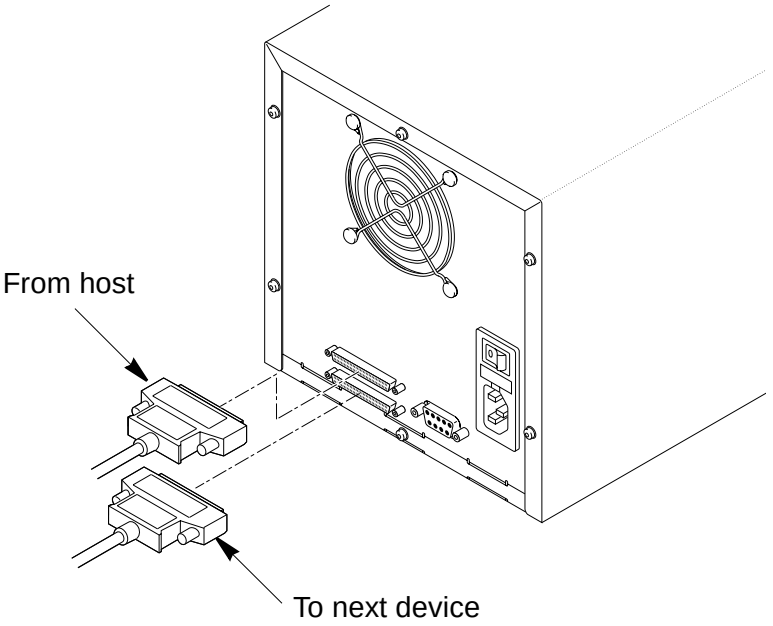
1. Connect a SCSI cable to one of the SCSI connectors on the back of the autoloader. Use an appropriate SCSI adapter if you are connecting the autoloader to a narrow SCSI bus (see page 128 for more information).

> **CAUTION**
>
> All wide SCSI configurations (SE, LVD, and HVD) use the same 68-pin connector. Connecting a single-ended or LVD tape drive directly to an HVD SCSI bus may cause the SCSI bus to hang.

2. If the autoloader is the last device on the SCSI bus, install a terminator on the unused connector, as shown in the following figure. See page 127 for information about terminator requirements.



3. If the autoloader is not the last device on the bus, connect a SCSI cable from the unused SCSI connector to the next device on the bus, as shown in the following figure.

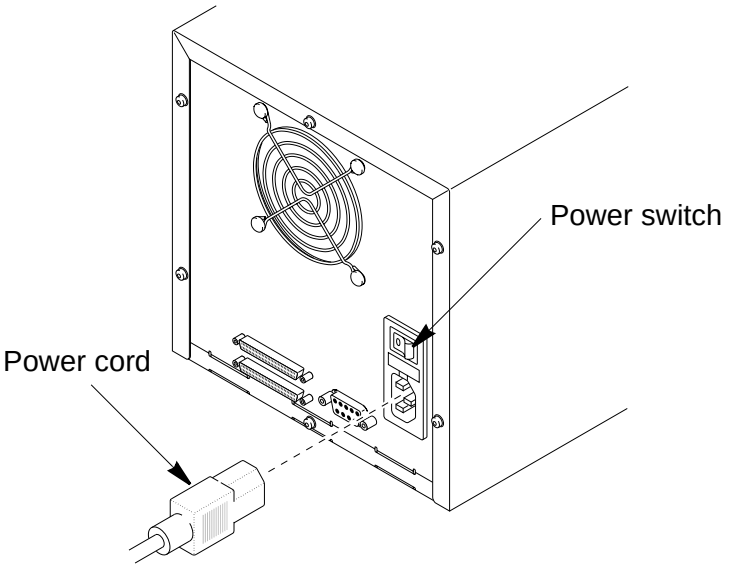


Connecting the power cord

➤ **Important** The power cord shipped with the autoloader is a 120 VAC three-conductor power cord for use in the United States and Canada. If you are planning to use an input voltage other than 120 volts AC or if you plan to use the autoloader outside of the United States or Canada, you must supply your own power cord. Refer to page 124 for more information.

1. Verify that the power switch on the back of the autoloader is off (the **0** is pressed).

2. Connect the female end of the power cord to the power connector on the back of the autoloader.



3. Plug the male end of the power cord into the power source.

   Note: The autoloader has autoranging voltage selection, so you do not need to change the voltage setting.

Powering on the autoloader

1. Power on the host computer system.

   Note: If your host system requires that attached peripheral devices be powered on before the host, power on the autoloader before you power on the host.

2. Push the power switch on the back of the autoloader to the on position (the **I** is pressed).

3. Wait while the autoloader performs its power-on sequence. During this time, the following activities occur:

   - The cooling fan begins to rotate.
   - The LCD illuminates and displays the initialization sequence.
   - The drive and the autoloader perform their power-on self-tests.
   - The LCD displays the Status screen.

Verifying the hardware installation

If the autoloader does not power on as described, check the following:

- Is the power switch on?
- Is the power cord inserted correctly?
- Is the SCSI bus terminated?
- Is the host computer system powered on?
- Is the SCSI cable connected to the autoloader and host computer?
- Is there an error code displayed on the autoloader LCD? (See Appendix C.)

If you cannot resolve the problem yourself, contact Exabyte (see "Contacting Exabyte" on the inside back cover).

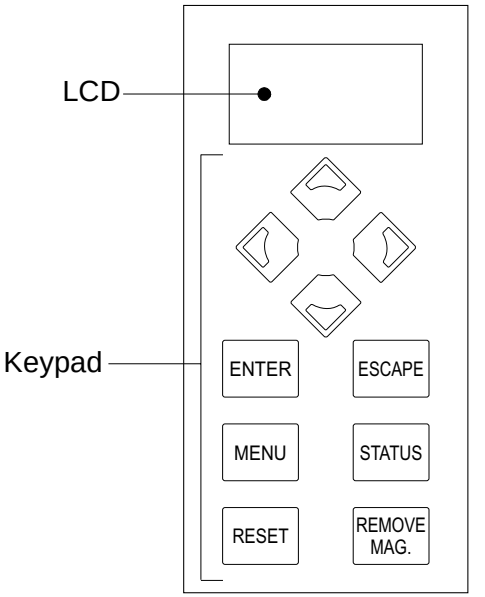
3 Configuration

This chapter provides steps for configuring the autoloader, as follows:

- Start by reading the first section, "Using the operator panel" for general information about the keypad, LCD, and menus.
- Then follow the instructions in "Configuring the autoloader" on page 33 to set the SCSI IDs and other configuration options.
- Be sure to follow the guidelines at the end of this chapter in "Checking the setup" on page 44.
- Finally, read "Beginning autoloader operations" on page 45.

Using the operator panel

The autoloader includes an operator panel consisting of a two-line LCD and a keypad (shown in the following figure). The operator panel allows you to interactively control autoloader operations. You can set autoloader options, check operating statistics, and exercise autoloader hardware.



Operator keys

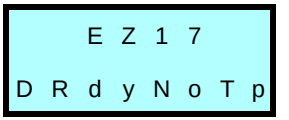
Use the keys on the operator panel to perform the operations described in the following table.

Keys	Operations
↑ ↓	Scrolls up or down through the menus or increases or decreases option values.
← →	Shifts the screen arrow left or right one digit when changing SCSI IDs, password, number of moves, and so on.
REMOVE MAG	Requests motion to stop and releases the solenoid so you can remove the magazine. **Note:** The robot parks in front of the drive. If you want to access the drive, use the Park & Unlock command from the Main Menu.
ESCAPE	Goes up one level from the current menu option, cancels changes, and stops tests and demonstrations that were started through the Command Menu or Demo Menu.
ENTER	Selects the menu (goes down one level) or confirms a parameter change or selection.
RESET	Resets the autoloader (requires confirmation). **Note:** To reset the drive, power cycle the autoloader.
MENU	Goes directly to the top of the Main Menu (to the Security Menu).
STATUS	Goes directly to the Status screen. The Status screen is the default after a reset.

Status screen

The Status screen appears when you power on the autoloader. The first line of the Status screen displays high-level autoloader status. If there is not any high-level status to report, the first line displays the product name. The second line displays low-level autoloader status. If there is not any low-level status to report, the second line displays the tape drive's status.

An example of the Status screen with a status message "Drive Ready, No Tape" is shown below.



Note: The exact wording of your Status screen may be different.

Error codes

If a hardware error occurs, an error code and a brief description appears automatically on the Status screen. You must correct the error before operation can continue. (Refer to Appendix C for help in diagnosing and correcting errors.)

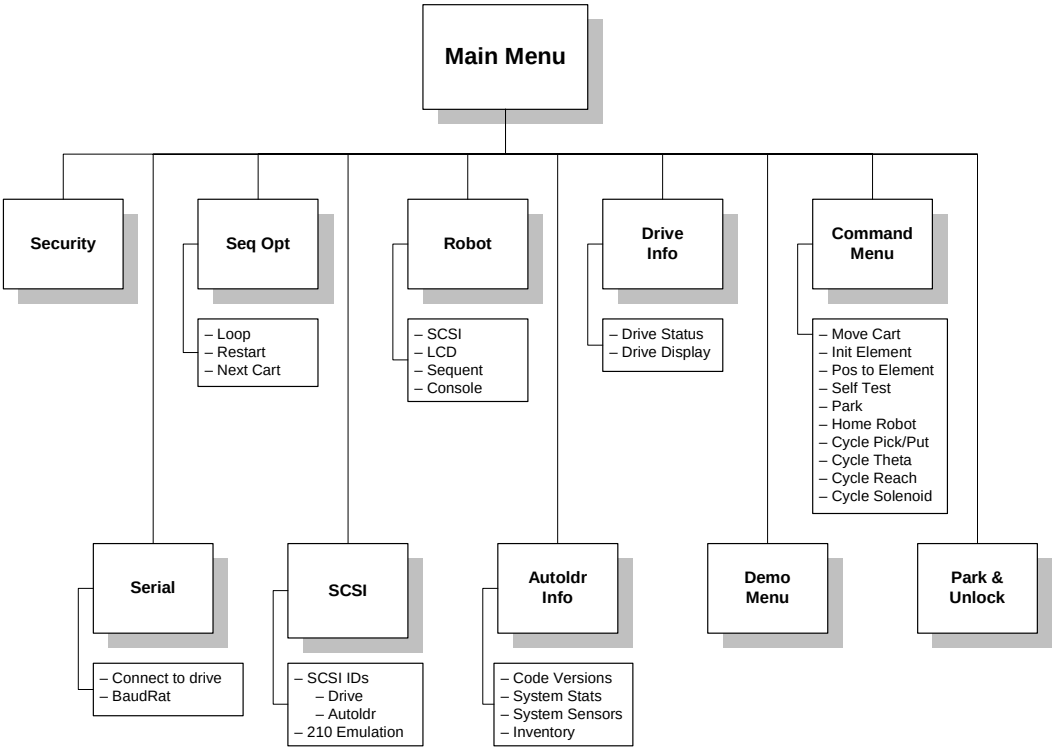
The error message provides the error's numerical code and a brief explanation of the error.

Menus

To access the Main Menu, press MENU. Then, press ↑ or ↓ repeatedly to loop through the menus and return to where you started.

Menus with ▸ are menus that have changeable options. Menus with ■ are menus that only have viewable information. Press ENTER to view the options or information available from the menu you want.

The menu structure is shown in the following figure. The selections available from the Main Menu are described in the table following the figure.



Main menu selections	
Securty (Security)	Allows you to set LCD security. Shows if security is disabled. If security is enabled, shows the method that was used to set security (LCD or SCSI).
Robot (Robot Control Mode)	Allows you to specify how robot motion is controlled and shows the current robot control mode. The robot control modes are SCSI, Sequential, LCD, and Console.
SCSI	Allows you to set SCSI IDs for the autoloader and drive, allows you to set Exabyte 210 emulation, and shows the current settings.
Seq Opt (Sequential Options)	Allows you to set Loop, Restart, and Next Cart to 1, and shows the current settings.
Serial	Allows you to set the baud rate of the autoloader's serial port and connect the serial port to the drive.
Autoldr Info (Autoloader Information)	Allows you to view the code versions, system statistics, system sensors, and inventory.
Drive Info	Shows drive status, drive error messages, and tape motion information.
Demo Menu	Provides options for running the autoloader in a continuous demonstration mode, where the robot randomly moves cartridges.
Command Menu	Allows you to perform specific robot movements and tests.
Park & Unlock	Allows you to park the robot at the top of its theta axis (the arced path the robot travels to access cartridges) and release the magazine's solenoid (the magazine's locking mechanism).

Configuring the autoloader

This section describes how to set the autoloader's configuration options. Refer to the table below for an explanation of each configuration item and determine which ones you need to set. Then, follow the appropriate steps in this section to set those options.

Configuration option	Description	See...
SCSI Menu:		
SCSI IDs	Setting SCSI IDs is required for autoloader operation. View the default settings and change them if necessary.	Page 34
Emulation Mode	Setting an emulation mode is required if your application software does not support an Exabyte EZ17, but does support an Exabyte 210 library.	Page 36
Robot Menu:		
Robot Control	Setting the robot control option determines which interface is used to control the motion of the robot. The control mode options are SCSI, Sequential, LCD, and Console.	Page 38
Sequential Options	Provides options for using the autoloader's Sequential mode. (See page 53 for more information and instructions for setting the Sequential mode options.)	Page 38
Serial	Allows you to set the baud rate for the autoloader's serial port or choose to communicate with the drive over the serial port (see page 102).	Page 91
Security Menu:		
Security	Setting security allows you to prevent unauthorized personnel from disrupting the operation of the autoloader.	Page 40

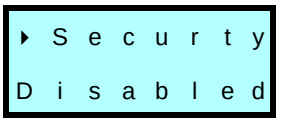
Setting the SCSI IDs

Default SCSI IDs are assigned at the factory for the autoloader and the drive. This section describes how to view the default settings and change them if necessary.

➤ **Important** The autoloader and drive must each have a unique SCSI ID.

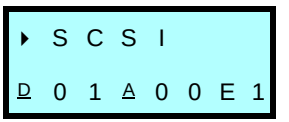
To view or change the SCSI IDs:

1. Press MENU. The following screen appears:



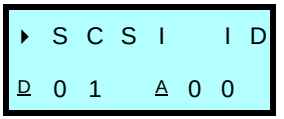
Note: If security is enabled, the second line of the LCD displays `LCD PW` or `SCSI` (depending on what mode was used to set security). If necessary, disable LCD security, as described on page 42.

2. Press ↑ or ↓ to scroll through the Main Menu until you see the following screen:

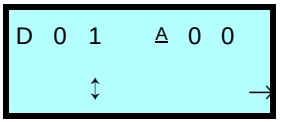


- D01– the current SCSI ID of the tape drive
- A00– the current SCSI ID of the autoloader
- E1– 210 emulation is on (1) or off (0)

3. Press ENTER. The following screen appears:



4. If you want to change the current settings, press ENTER. The message `Set SCSI IDs` flashes on the screen, then the following screen appears:



5. To change the drive's SCSI ID, press ↑ or ↓ until you see the ID you want. Or, if you only want to change the autoloader's SCSI ID, press →. The screen arrow moves to the far right digit in the autoloader's SCSI ID.

   Note: Certain software applications require the autoloader SCSI ID to be set one digit lower than the drive SCSI ID. Refer to the documentation for your software application for more information.

6. Press ↑ or ↓ until you see the SCSI ID you want for the autoloader.

7. Press ENTER.

8. If you changed the SCSI ID for the drive, the following message flashes on the screen:

   `Power cycle the autoloader to change the drive SCSI ID or press ESCAPE to cancel`

To keep the SCSI ID you set, power the autoloader off, wait 10 seconds, and then power it back on. If you do not want to keep the tape drive SCSI ID, press ESCAPE.

> **CAUTION**
>
> Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the drive sufficient time to complete its reset operation.

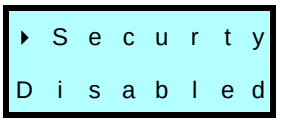
Note: You do not need to power cycle the autoloader if you only changed the autoloader's SCSI ID.

Setting the Emulation mode

Use the 210 emulation mode if your application software does not support the EZ17 and does support the Exabyte 210 library. When emulation is on, the autoloader responds "EXB-210" to a SCSI INQUIRY command. This allows you to use most (but not all) application software packages that provide a driver for the Exabyte 210 library but not for the Exabyte EZ17 autoloader.

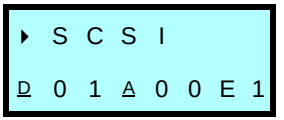
To set the autoloader to Exabyte 210 emulation mode:

1. Press MENU. The following screen appears:



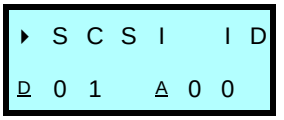
2. Disable LCD security, as described on page 42, if it is enabled.

3. Press ↑ or ↓ to scroll through the Main Menu until you see the following screen:

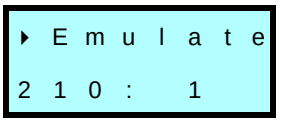


In the example above, the "E" indicates whether 210 emulation is on (1) or off (0).

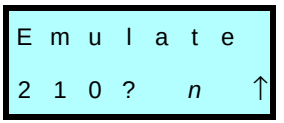
4. Press ENTER to view the options in the SCSI Menu, if you want to change the 210 emulation setting. The following screen appears:



5. Press ↑ or ↓ until the following screen appears:



6. Press ENTER to view the emulation options. The following screen appears:



In the example above, *n* is either 0 or 1.

7. Press ↑ or ↓ until you see the setting you want. If you want 210 emulation on, press ENTER when the LCD displays 1. If you want 210 emulation off, press ENTER when the LCD displays 0.

Setting the Robot Control mode

The robot control mode determines which interface is used to control the motion of the robot. Robot control modes are described below. After you select a control mode, it remains in effect until you change it. Cycling the power or resetting the autoloader does not change the control mode.

SCSI If you want the application software to control autoloader operations, you must set the autoloader to SCSI mode. In this standard operating mode, the application software controls the motion of the robot by issuing SCSI commands across the SCSI bus.

Note: The application software can issue commands to the autoloader regardless of the robot control mode. However, the autoloader must be in SCSI mode for the application software to control the robot's motion.

For detailed information about SCSI commands, refer to the *Exabyte EZ17 Autoloader SCSI Reference*.

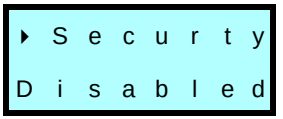
Sequential If you want the autoloader to run as a sequential stacker device, you need to set the autoloader to Sequential mode. In this mode, the application software does not need to provide support for autoloader functions, only for the drive. For detailed information about using Sequential mode, see page 53.

LCD If you want to perform operations from the operator panel that involve moving the robot or connecting the serial port to the drive, you need to set the autoloader to LCD mode. These operations, such as exercising the autoloader's components, and communicating with the drive over the serial port, are included under the Command Menu, the Demo Menu, or the Serial Menu.

Console When the autoloader is operating in Console mode, you can download new firmware, perform a diagnostic listing, and view the LCD password. Your host must have a remote terminal emulation program and be connected to the autoloader's 9-pin serial port. (See Chapter 6 for instructions.)

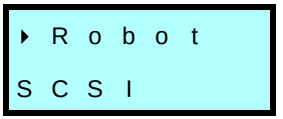
To change the robot control mode:

1. Press MENU. The following screen appears:



2. Disable LCD security, as described on page 42, if it is enabled.

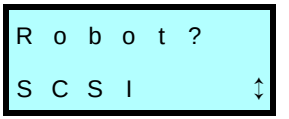
3. Press ↑ or ↓ to scroll through the Main Menu until you see the following screen:



4. Press ENTER. The following message flashes on the screen:

```
Select I/F that controls robotic motions
```

Then, the following screen appears:



> ➤ **Important** If you select Sequential mode, you need to set the Loop and Restart options (see page 56 for instructions). If you select Console mode, you need to set the autoloader's baud rate to match the host computer's baud rate (see page 91 for instructions).

5. Press ↑ or ↓ until you see the control mode you want and press ENTER to select it.

Setting the LCD Security option

The Security option allows you to prevent unauthorized personnel from disrupting the operation of the autoloader. When you enable security, the following activities are prevented:

- Changing SCSI IDs
- Changing the robot control mode
- Changing 210 emulation
- Unlocking and removing the magazine
- Using the Command Menu and Demo Menu
- Connecting the serial port to the drive
- Changing Sequential mode options

If you attempt to perform any of the previous operations when security is enabled, the autoloader displays a message indicating that security is active. The message also indicates whether security was enabled from the LCD or by the application software with a SCSI command.

You can set security in either of two ways:

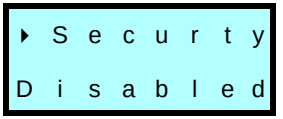
- You can set the security option from the LCD, as described in this section.
- The application software can issue a SCSI MODE SELECT command to enable or disable security (see your software documentation).

Whichever method you use to enable security (LCD or SCSI), you must also use it to disable security. That is, if you enable security from the LCD, you must disable it from the LCD.

Note: The security setting is unaffected by cycling the power or resetting the autoloader.

Enabling security from the LCD

1. From the Status screen, press MENU. The following screen appears:

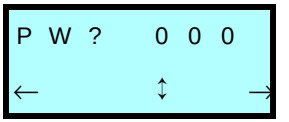


2. Disable LCD security, as described on page 42, if it is enabled.

3. Press ENTER to display the Security Menu. The following message flashes on the screen:

   ```
   Select password and press ENTER to enable
   security or ESCAPE to cancel
   ```

   Then, the following screen appears:



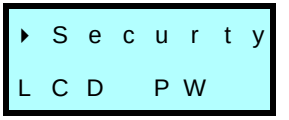
4. Select a three-digit password. Press ← or → to move the screen arrow under the digit in the password that you want to change and ↑ or ↓ to change the number. (The default password is 000.) When you are finished, press ENTER.

> ➤ **Important** You must use the same password to disable security.

5. A confirmation message appears. Press ENTER to accept the password and enable security. Or, to exit without saving the password and without enabling security, press ESCAPE.

Disabling security from the LCD

1. From the Status screen, press MENU. The following screen appears:

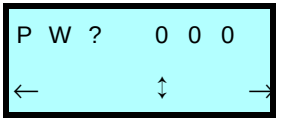


Note: If the menu displays `Disabled`, the security option is already disabled. If the menu displays `LCD PW`, security was enabled using the LCD as described in the following steps. If the menu displays `SCSI`, security was enabled by your application using a SCSI command. If a SCSI command was used to enable security, it must be used to disable security. Refer to your software documentation for instructions.

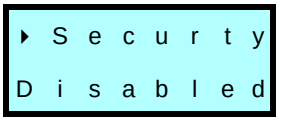
2. Press ENTER to enter the Security Menu. The following message flashes on the screen:

```
Enter password and press ENTER to disable
security or ESCAPE to cancel
```

Then, the following screen appears:



3. Enter the three-digit password you selected when you set security. Press ← or → to move the screen arrow under the digit in the password that you want to change and ↑ or ↓ to change the numbers. (The default password is 000.) When you are finished, press ENTER. The following screen appears:



If you enter the wrong password, the system displays an error message.

Note: If you forget the password, try entering the default password (000). If the password has been changed from the default and you do not know what it is, see Chapter 6 for instructions about how to view the LCD password.

Checking the setup

After you install the hardware and software, check the setup by performing the suggested exercises below. While these exercises are not required, it is a good idea to verify that your software and hardware are properly communicating before you begin operations.

- Use the Demo Menu to exercise the hardware. This determines whether the autoloader hardware components are operating properly. See "Using the Demo Menu" on page 69 for more information.
- Use the application software to load and unload one or more cartridges into the drive. This determines whether the software, autoloader, and drive are communicating properly.
- Back up several megabytes of data and perform a comparison check on the backed up data. This determines whether the software and drive are communicating properly.

If the autoloader and drive are not operating as expected, see Chapter 7 for troubleshooting information. If there is an error code displayed on the LCD, see Appendix C for a list of error codes and corrective actions. If you cannot solve the problem yourself, contact your service provider or Exabyte (see "Contacting Exabyte" on the inside back cover).

Beginning autoloader operations

After you configure the autoloader, you are ready to perform backup and restore operations. However, before you begin, check the following:

- The drive does not have a cartridge loaded.
- The robot does not contain a cartridge.
- The cartridge magazine is installed.
- The autoloader is in the proper control mode. The standard operating mode is SCSI (see page 38).

Notes

4 Autoloader Operation

This chapter describes the following autoloader operations you may need to perform:

- Removing and replacing the magazine
- Storing cartridges
- Operating the autoloader in Sequential mode
- Setting Sequential mode options
- Avoiding interruptions
- Viewing autoloader information
- Performing hardware exercises
- Resetting the autoloader

Note: The application software automatically controls the autoloader's robotics to perform backup and restore operations. You do not need to intervene in the cartridge processing; however, you may need to occasionally perform the tasks described in this chapter.

Removing and replacing the magazine

This section describes removing and replacing the magazine to access the cartridges and the drive.

Removing the magazine

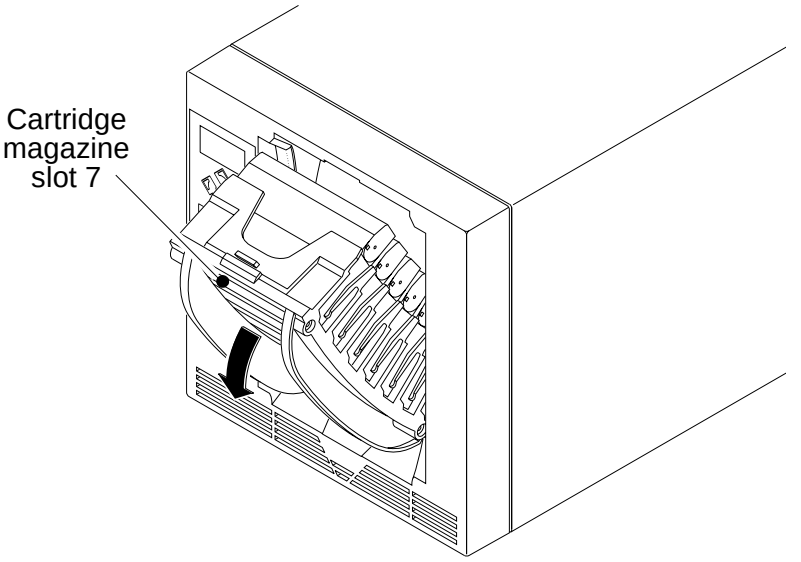
To remove the magazine to access the cartridges or the drive, follow these steps:

1. Release the magazine by pressing REMOVE MAG and follow the instructions on the screen. When the autoloader finishes the current operation, it parks the robot in front of the drive and releases the magazine's solenoid.

   Note: Pressing REMOVE MAG parks the robot in front of the drive. If you want to access the drive, use the Park & Unlock command from the Main Menu.

2. Grasp the magazine at the top (near cartridge slot 7) and pull out, as shown in the following figure.

> **CAUTION**
>
> Do not force the magazine out of the autoloader. Doing so may damage the magazine or the robot.



If the magazine does not release easily, the autoloader's security setting may be turned on or the robot's gripper may be holding a cartridge. Check the security setting and disable security, if necessary (see "Disabling security from the LCD" on page 42).

If you suspect the robot's gripper is holding a cartridge, power the autoloader off, wait 10 seconds, and then power it back on.

CAUTION

Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the drive sufficient time to complete its reset operation.

Installing the magazine

To install the magazine after accessing the cartridges or the drive, follow these steps:

➤ **Important** Use only magazines designed for the Exabyte EZ17M and EZ17A autoloader. Do not use Exabyte magazines designed for other Exabyte libraries.

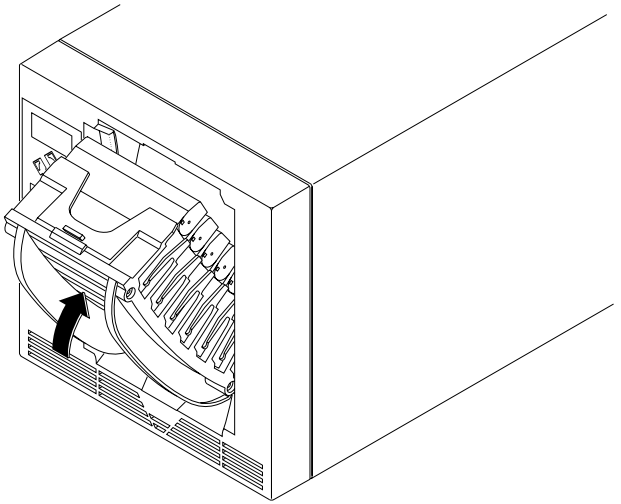
Before installing the magazine, make sure there is not a cartridge in the drive. If you install the magazine when there is a cartridge in the drive, the autoloader cannot complete its power-on self-test, resulting in an error.

1. Position the magazine so the bottom mounting guide on the magazine (near cartridge slot 1) aligns with the slot in the bottom of the opening in the autoloader, as shown in the following figure

CAUTION

Do not force the magazine into the autoloader. Forcing the magazine may break the cartridge slot fingers.

2. Push the top of the magazine until it snaps into place.



Storing cartridges

To maximize the shelf life of your cartridges and ensure data integrity, follow the guidelines below when storing cartridges.

- **Store cartridges in a suitable environment**. Follow the specifications for storage temperature and other environmental requirements, as described on the cartridge packaging. Do not allow the temperature and humidity in the storage environment to fluctuate.

- **Keep the storage location as free of airborne particulates as possible**. To eliminate obvious sources of particulates, do not permit anyone to smoke, eat, or drink near the storage area, and do not store cartridges near a copier or printer that may emit toner and paper dust.

- **Store cartridges with the write-protect switch in the protected position**. See page 18.

- **Store cartridges as soon as possible** after you remove them from the autoloader. Immediate storage helps avoid many of the conditions that can damage tapes, such as temperature and humidity fluctuation, particulate contamination, and excessive handling.

- **Store cartridges in a cartridge magazine, if possible**. In the cartridge magazine, cartridges are protected from airborne contaminants by a plastic cover.

Operating the autoloader in Sequential mode

When the autoloader is operating in Sequential mode, its internal firmware instructs the robot to move cartridges sequentially between the cartridge slots and the drive. No application software is required to support cartridge pick and place functions.

In Sequential mode, the autoloader performs the following steps:

1. Picks the cartridge from slot 1 and places it in the drive. If the slot is empty, the robot picks the next cartridge in the magazine.

2. Waits until the drive ejects the cartridge, then returns the cartridge to its original slot.

3. Repeats these steps for the next cartridge until it has processed all of the cartridges in the magazine.

4. Depending on how the Loop option is set, the robot either returns to the first cartridge and begins the process again, or stops. The Loop option is described in the following section.

Sequential options

To customize how Sequential mode works, you can set the Loop, Restart, and Next Cart options. These options are not affected by a reset or power cycle.

Loop option

The Loop option determines what the autoloader does after it has finished processing the last cartridge in the magazine. As shown in the following table, the autoloader can either loop back to the first cartridge in the sequence and start processing the cartridges again or stop and wait for operator intervention. (Operator intervention typically means removing the autoloader's magazine and inserting a new magazine.)

If Loop is...	The autoloader...
On	Returns to cartridge 1 and starts processing the cartridges again.
Off	Stops processing cartridges and waits for operator intervention.

Restart option

The Restart option determines where the autoloader restarts after it is reset or power cycled, or after the magazine is removed and replaced. The autoloader can restart either at the beginning of the cartridge sequence or where it left off when the interruption occurred.

As shown in the following table, the Restart option determines what the autoloader does next.

If Restart is...	The autoloader...
On	Restarts at slot 1.
Off	Resumes where it left off.

Before the autoloader restarts Before restarting, the autoloader performs the following actions:

1. The autoloader performs a power-on self-test (POST).
2. If the robot was moving a cartridge, it finishes the move. (This includes inserting the cartridge into the drive if the robot was moving a cartridge to the drive.)

   Note: If you attempted to remove the magazine, the autoloader does not release the magazine's solenoid until it has completed the move.

3. If a cartridge is in the drive, the following happens:

   a. The robot waits for the drive to eject the cartridge, then reseats the cartridge in the drive.

   b. The autoloader initializes element status to check for cartridges in the magazine.

   c. The robot returns the cartridge to its original slot.

Next Cart option

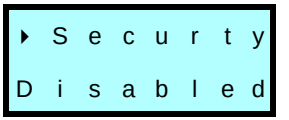
The Next Cart option allows you to interrupt sequential processing and specify that the next cartridge the autoloader selects is the cartridge in slot 1. If you want to resume sequential processing from the first cartridge, select Next Cart from the Sequential Options Menu.

Setting Sequential mode options

This section describes how to set the Loop, Restart, and Next Cart options after you have configured the autoloader to run in Sequential mode.

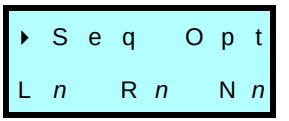
To set the Sequential mode options, follow these steps:

1. From the Status screen, press MENU. The following screen appears:



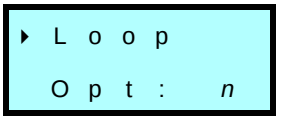
2. Disable LCD security if it is enabled, as described on page 42.

3. Press ↑ or ↓ to scroll through the Main Menu until you see the Sequential Options screen:

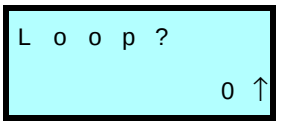


In the example above, each *n* has the value described below:
L – Loop option: *n* = 1 (on) or 0 (off).
R – Restart option: *n* = 1 (on) or 0 (off).
N – the next cartridge to be processed: *n* = 1 to 7.

4. Press ENTER. The Loop Option screen appears:

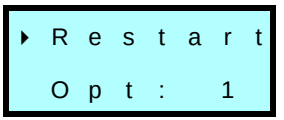


5. Press ENTER to display the screen for changing the Loop option:

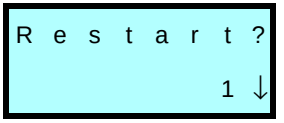


6. Press ↑ or ↓ until you see the setting you want. If you want Loop on, press ENTER when the LCD displays `1`. If you want Loop off, press ENTER when the LCD displays `0`. The Loop Option screen shows the new setting.

7. Press ENTER to display the Restart Option screen:

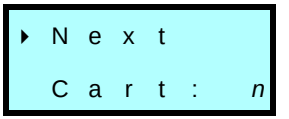


8. Press ENTER to display the screen for changing the Restart option:



9. Press ↑ or ↓ until you see the setting you want. If you want Restart on, press ENTER when the LCD displays `1`. If you want Restart off, press ENTER when the LCD displays `0`. The Restart Option screen shows the new setting.

10. Press ENTER to display the Next Cartridge screen:



In the example above, *n* is a number from 1 to 7.

If *n* is 1, the next cartridge the autoloader will process is the cartridge in slot 1. You do not need to modify this setting.

If *n* is a number from 2 to 7 and you want the next cartridge the autoloader processes to be the cartridge in slot 1, press ENTER. The following message flashes on the screen:

```
Press ENTER to set next cart to 1 or ESCAPE to
cancel
```

11. Press ENTER again to set the next cartridge to 1.

12. Press ESCAPE to return to the Sequential Options screen.

Avoiding interruptions

Although the autoloader has effective methods for resuming operation, it is best to avoid interruptions when the autoloader is operating in Sequential mode. In particular:

- **Do not reset or power cycle the autoloader unless absolutely necessary**. Reset the autoloader only to clear certain autoloader error conditions and power off the autoloader only to perform maintenance or to store it. Avoid resetting or power cycling the autoloader when a cartridge is in the drive or the robot.

- **Do not remove the magazine unless absolutely necessary**. During operation, remove the magazine only after the autoloader has processed all the cartridges. Never force the magazine. The autoloader will not release the magazine until it has completed a cartridge move or load already in progress. Certain applications may also prevent the magazine from being removed.

- **Do not remove a cartridge from the drive or insert a cartridge into the drive**. If you want to remove a cartridge, wait until the robot has placed it in the magazine before removing it. If you want to add a cartridge, add it directly to the magazine.

Viewing autoloader information

The functions in the Autoloader Info Menu are mainly for use by technical support and application developers. Technical support may ask you to display one of these screens and locate information to help troubleshoot a problem.

This section describes the following autoloader information:

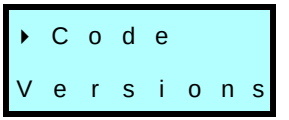
- **Code Versions.** Contains information about the flash code level and the boot code level.
- **System Statistics.** Contains information about robot operations.
- **System Sensors.** Contains information about the autoloader's mechanical sensors.
- **Inventory.** Contains information about the elements.

Viewing code versions

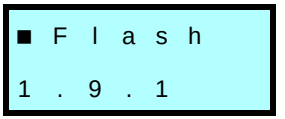
The Autoldr Info Menu contains information about the flash code level and the boot code level.

To view code levels:

1. Select Autoldr Info Menu from the Main Menu, then scroll until you see the following screen:

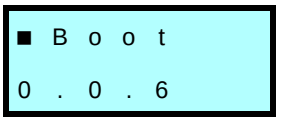


2. Press ENTER. The following screen appears:



Note: Your code levels may be different.

3. To view the level of the boot code, press ↑ or ↓ until you see the following screen:

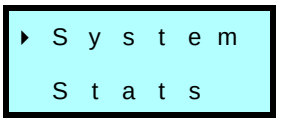


Viewing statistics

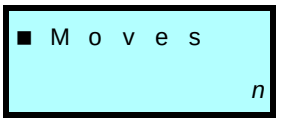
The Autoldr Info Menu contains a System Stats submenu.

To view statistics:

1. Select Autoldr Info Menu from the Main Menu, then scroll until you see the following screen:



2. Press ENTER to view the system statistics. The following screen appears:



In the previous example, *n* is the total number of times the robot has picked a cartridge and placed it in the drive or a cartridge slot.

3. To view the other system statistics, press ↑ or ↓ until you see the statistic you want. The following table describes the system statistics you can view.

Note: The System Statistics are cumulative across resets.

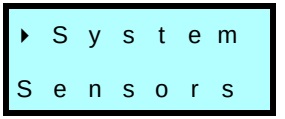
System Statistics	Description
PickRet (Pick Retry)	The number of times the robot retried picking a cartridge.
PutRet (Put Retry)	The number of times the robot retried placing a cartridge.
ThetRe (Theta Retry)	The number of times the robot retried to position itself on the theta axis.
PwrCnt (Power Cycle Count)	The number of times the autoloader has been power cycled or reset from the operator panel.
Loads	The number of times the robot loaded (pushed) a cartridge into the drive.
Reloads	The number of times the robot reloaded the cartridge in the drive because the drive ejected the cartridge too soon.
ShrtLds (Short Loads)	The number of times the robot reloaded a cartridge into the drive, either because the drive ejected the cartridge too soon and the cartridge was not ejected far enough, or the cartridge did not load completely into the drive on the first attempt.
DPckRet (Drive Pick Retry)	The number of times the robot retried picking from the drive because the drive did not eject the cartridge far enough.

Viewing system sensors

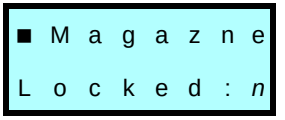
The System Sensors screens enable you to troubleshoot hardware problems by checking the current status of the autoloader's internal mechanical sensors.

To view system sensors:

1. Select Autoldr Info Menu from the Main Menu, then scroll until you see the following screen:



2. Press ENTER to view the system sensor information. The following screen appears:



In the preceding example, *n* indicates whether the magazine is locked (1) or unlocked (0).

3. To view the other system sensors, press ↑ or ↓ until you see the sensor you want. The following table describes the remaining system sensors.

System sensors	Description
Magazne Presnt (Magazine Present)	Indicates whether the magazine is inserted in the autoloader (1) or not (0).
Cart Ejectd (Cartridge Ejected)	Indicates whether a cartridge is protruding from the drive (1) or not (0).
Cart Seated (Cartridge Seated)	Indicates whether a cartridge is seated in the robot (1) or not (0).
Slot Snsr	Provides feedback that helps the firmware track where the robot is on its theta axis.
Theta Home	Indicates whether the robot is in its home position (1) or not (0).
Picker St (Picker State)	Indicates the status of the robot's picker mechanism, as follows: 07 –The picker is at home position (fully extended). 1f – The picker is in the tray position. 0a –The picker is extended (waiting for the cartridge to eject from the drive). 0c –The picker is retracted. 0f – The picker is between the home position and the tray position. 1e –The picker is between the tray position and the extended position. 0e –The picker is between the extended position and the retracted position.

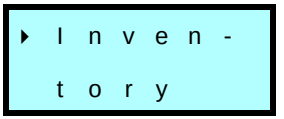
Viewing inventory information

The autoloader stores inventory information in nonvolatile RAM and uses the information to process SCSI commands from the application software. The inventory contains information about the following element locations:

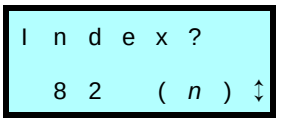
- Cartridge slots
- Tape drive
- Robot

To view the Inventory Menu:

1. Select Autoldr Info Menu from the Main Menu, then scroll until you see the following screen:



2. Press ENTER to view the inventory information. The following screen appears:



In the example above, *n* can be D, R, or S, as follows:
D – the drive
R – the robot
S – a cartridge slot

3. Press ↑ or ↓ to select the element index you want to view. Then press ENTER. The following table describes the inventory information you can view about each element.

Inventory information	
Element info	**Description**
Occup (Occupied)	Indicates whether the autoloader considers the specified element location to contain a cartridge (1) or not (0).
Valid (Occupied Valid)	Indicates whether the Occupied flag is accurate (1) or questionable (0).
Access (Tape Drive Accessible)	Indicates whether a cartridge is loaded in the drive (0) or the drive is empty or the cartridge is ready to be picked (1).
Present (Cartridge Magazine, Tape Drive Present)	Indicates whether the magazine or drive is installed (1) or not (0). If the element index references a storage element, this flag indicates whether the magazine is installed. If the element index references the drive, this flag indicates the drive is installed. **Note:** The Present flag is always 1 for the robot.
Warning	Shows if there are any errors for the specified element index. (See Appendix C for a list of error codes and corrective actions.)
Source (Source Element Index)	Shows the index of the last storage element from which a cartridge was moved.
Theta	Shows the theta axis position in steps from the home position.
Address	Shows the SCSI element address of the specified element.

Inventory information *(continued)*	
Element info	**Description**
Rsrv (Reserved)	The element is reserved by a host (1) or not (0).
Host	The SCSI ID of the host that is reserving the element.
Reserve ID	The ID that the element is reserved under. This is a number assigned to the element by a host when the reservation was made.
TotPuts Total Puts)	Shows the total times the robot tried to put to that element since the last reset.
PckRety (Pick Retry)	Shows the total times the robot retried to pick from that element since the last reset.
PutRety (Put Retry)	Shows the total times the robot retried to put to the element since the last reset.

Performing hardware exercises

This section describes how to perform hardware exercises using the Demo Menu and Command Menu from the operator panel. Both of these menus are available from the Main Menu. The Demo Menu causes the robot to randomly move cartridges between slots. The Command Menu provides options for specific robot movements.

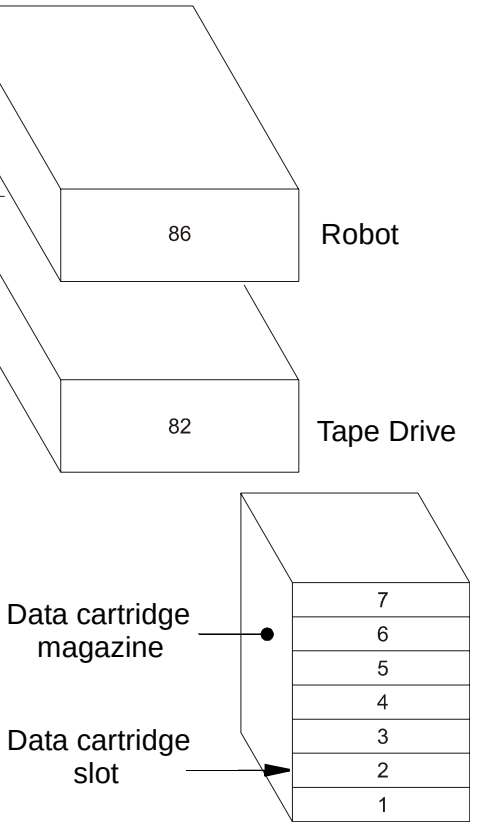
Using elements

Elements are the physical locations in the autoloader that can accept a cartridge (the robot, the magazine slots, and the drive).

Element indexes

Each element has an element index, which enables the autoloader to identify the elements. Many LCD functions require you to use element indexes. For example, to move a cartridge using the Command Menu, you must specify the source and destination element indexes. The source is either the drive or a cartridge slot where the robot will pick a cartridge. The destination is either the drive or a cartridge slot where the robot will place the cartridge.

The following figure shows the element indexes assigned for the autoloader.



Element addresses

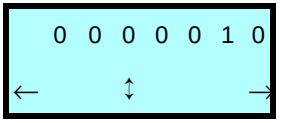
Your application software may use element addresses to identify elements in the autoloader. The difference between an element index and an element address is that an index is a fixed number set by the autoloader, whereas an address can be changed by your application software (using the SCSI MODE SELECT command).

The element indexes correspond to the autoloader's default element addresses. The element addresses are displayed in the Inventory Menu.

Using the Demo Menu

Before running the demo:

1. Disable security if it is enabled (see page 42).
2. Change the control mode to LCD (see page 39).
3. Verify that there is at least one cartridge present and one empty slot before you begin the test.
4. From the Main Menu, select Demo Menu. The message `Set total demo moves` flashes on the screen, then the following screen appears:

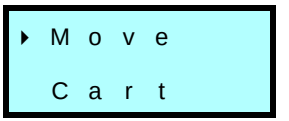
   

   In the example above, the number of demo moves is set to 10.
5. Press ↑ or ↓ to move the screen arrow to the digit you want to change, then press ↑ or ↓ to select the number you want.
6. Press ENTER to start the demo.

Using the Command Menu

To perform hardware exercises and inventory checks:

1. From the Main Menu, select Command Menu. The following screen appears:



2. If you want to move a cartridge, press ENTER. If you want to perform other exercises, press ↑ or ↓ until you see the exercise you want to perform and then press ENTER.

The following table describes each exercise and provides additional instructions for performing the tests (if applicable).

Test	Description	Additional instructions
Move Cart (Move Cartridge)	Moves a cartridge from one location to another. **Important:** Do not load a cartridge in the drive. The drive will not automatically eject the cartridge.	When you select Move Cart, the Move Src? screen appears. Press ↑ or ↓ to select the source index (the slot you want the robot to pick from), then press ENTER. The Move Dest? screen appears. Press ← or → to select the destination index (the slot where you want the robot to place the cartridge), then press ENTER.
Init Element (Initialize Element Status)	Performs an inventory of the cartridges.	

Test	Description	Additional instructions
Pos to Element (Position to Element)	Positions the robot in front of the drive or a magazine slot.	When you select Pos to Element, the Pos Elem Dest? screen appears. Press ← or → to select the element index where you want to position the robot, then press ENTER.
Self Test	Cycles the robot and picker through their entire ranges of motion once.	
Park	Moves the robot to the top of the autoloader.	
Home Robot	Moves the robot to its home position in front of the drive.	
Cycle Pick/Put	Causes the robot to take a cartridge from a specified element and replace it in the same location the number of times you requested.	When you select Cycle Pick/Put, the Cycle PP Src? screen appears. Press ← or → to select the source index (where you want the robot to pick and put the cartridge) and press ENTER. The message `Select number of test cycles` flashes on the screen. Press ← or → to move the screen arrow to the digit you want to change. Then, press ↑ or ↓ to select the number of cycles you want this test to run and press ENTER.
Cycle Theta	Moves the robot up and down the number times you requested.	When you select Cycle Theta, the message `Select number of test cycles` flashes on the screen. Press ← or → to move the screen arrow to the digit you want to change. Then, press ↑ or ↓ to select the number of cycles you want this test to run and press ENTER.

Test	Description	Additional instructions
Cycle Reach	Causes the following: ▪ The robot to move to its home position on the theta axis ▪ The picker to move to the extended position, to the retracted position, and back to the extended position	When you select Cycle Reach, the message `Select number of test cycles` flashes on the screen. Press ← or → to move the screen arrow to the digit you want to change. Then, press ↑ or ↓ to select the number of cycles you want this test to run and press ENTER.
Cycle Solenoid	Exercises the solenoid that controls the locking mechanism on the magazine the number of times you requested.	When you select Cycle Solenoid, the message `Select number of test cycles` flashes on the screen. Press ← or → to move the screen arrow to the digit you want to change. Then, press ↑ or ↓ to select the number of cycles you want this test to run and press ENTER. You will hear a click each time the solenoid extends and retracts.

Resetting the autoloader

If the autoloader has encountered an error and is still not operating after you have tried the recommended corrective action for the error, you may need to reset the autoloader. A reset causes the autoloader to perform its power-on self-test.

CAUTION

Before resetting the autoloader, make sure it is not communicating across the SCSI bus. Resetting the autoloader may disrupt communications on the SCSI bus.

To reset the autoloader, use one of the following methods:

- Press RESET on the operator panel, then press ENTER at the confirmation screen (or press ESCAPE to cancel).
- Perform a power-on reset by powering the autoloader off, waiting 10 seconds, then powering it back on.

> **CAUTION**
>
> Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the drive sufficient time to complete its reset operation.

When the power-on self-test is complete, the Status screen appears on the LCD.

Note: If the autoloader is performing a cartridge move operation when it is reset, it attempts to complete the move operation after it performs the power-on self-test.

Notes

5 Tape Drive Operation

The application software automatically controls the drive to perform backup and restore operations. Normally, you do not need to intervene in the cartridge processing; however, you may occasionally want to perform the following tasks:

- Cleaning the drive
- Resetting the drive
- Displaying information about the drive
- Monitoring the drive LEDs
- Ejecting a cartridge manually

Note: You cannot control the drive operation from the autoloader's operator panel.

Cleaning the drive

Clean the drive whenever the autoloader displays `ClnSoon` on the Status screen or whenever your application software notifies you. (Not all software applications display cleaning requirements.) Regular cleaning helps ensure that the drive functions reliably. If `MustCln` appears on the Status screen, the drive will not perform write or read functions until it is cleaned.

If your autoloader includes an M2 drive and you use AME with SmartClean cartridges exclusively, your drive will automatically perform the cleaning operation without any user intervention. If you do not use SmartClean cartridges exclusively, your M2 will require regular cleaning as described in the following sections.

If your autoloader includes a Sony AIT-2 drive, use cleaning cartridges specifically designed for AIT drives. The AIT drives should only require regular cleaning if your autoloader is operating in extreme environmental conditions.

Note: Some software applications automatically perform drive cleaning. If your application software supports automatic cleaning, store a cleaning cartridge in the magazine slot specified by the application. Refer to the documentation for your software.

Follow these steps to manually clean the drive:

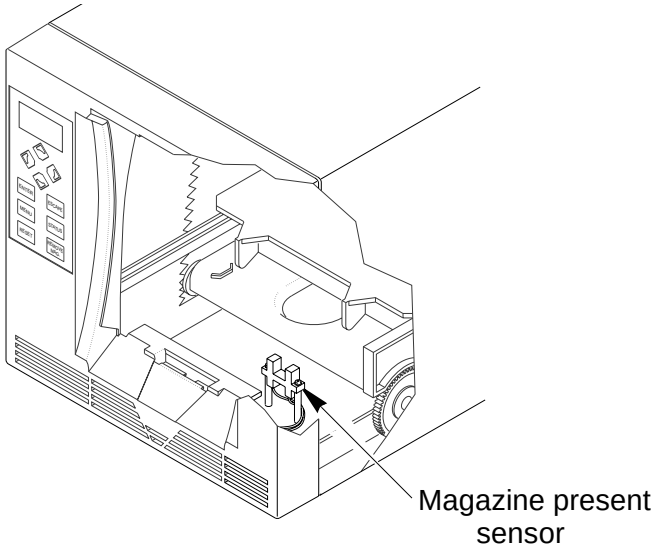
1. Park the robot and remove the magazine as described on page 48.

2. Insert the cleaning cartridge into the drive. The drive automatically performs the cleaning process and ejects the cartridge when the process is complete.

3. Remove the cleaning cartridge from the drive.

CAUTION

Do not touch the Magazine Present sensor when inserting or removing the cleaning cartridge.



4. Confirm that the cleaning was completed by looking at the autoloader's LCD. The `ClnSoon` or `MustCln` message should be gone.

If the LCD still displays `ClnSoon` or `MustCln`, replace the cleaning cartridge and clean the drive again. If the message is still on the autoloader LCD, or the drive LEDs are still on after the second cleaning, there may be a problem with the drive.

➤ **Important** If the drive ejects the cleaning cartridge immediately after loading it and the LCD displays the message `Depleted`, you need to replace the cleaning cartridge. To order cleaning cartridges, contact Exabyte (see "Contacting Exabyte" on the inside back cover).

5. Replace the cartridge magazine.

➤ **Important** Before reinstalling the magazine, make sure there is not a cartridge in the drive. If you install the magazine when there is a cartridge in the drive, the autoloader cannot complete its power-on self-test and will display an error.

Resetting the drive

If the drive has encountered an error and is still not operating after you have tried the corrective action for the error, you may need to reset the drive. A reset causes the drive to perform its power-on self-test.

To reset the drive, power the autoloader off, wait 10 seconds, and then power it back on.

> **CAUTION**
>
> Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the drive sufficient time to complete its reset operation.

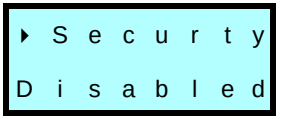
Note: Pressing RESET on the operator panel does not reset the drive.

Displaying information about the drive

From the operator panel, you can display information about the drive. The information screen is updated whenever there is a change in drive status.

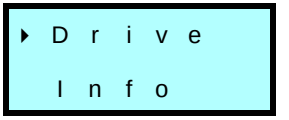
To display drive information:

1. Press MENU. The following screen appears:

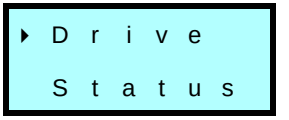


Note: It is not necessary to disable security to view drive information.

2. Press ↑ or ↓ until the following screen appears:



3. Press ENTER to display the Drive Info Menu. The following screen appears:



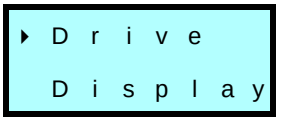
4. If you want to view drive status information, press ENTER to display the Drive Status screen. The following table lists the information displayed on the LCD's Drive Status screen.

Note: Not all of these fields are available for AIT-2 drives.

Status	Description
Type	Displays the type of drive installed.
Serial#	Displays the serial number of the drive.
BootVer (Boot Version)	Displays the code level of the drive's boot ROM.
FlshVer (Flash Version)	Displays the code level of the drive's flash EPROM.
Needs Clean	Indicates whether the drive is clean (0) or needs to be cleaned (1).

Status	Description
Cart St (Cartridge Status)	Displays the status of the cartridge, if any, in the drive: **Loaded** – A cartridge is in the drive and the tape is loaded into the tape path. **Loading** – A cartridge is being loaded into the drive. **Unloading** – A cartridge is being unloaded from the drive. **Present** – A cartridge is in the drive, but the tape is not loaded in the tape path. **Empty** – The drive does not contain a cartridge.
Format	Displays the data format of the cartridge currently in the drive.
Present	Indicates whether a drive is installed (1) or not (0).
Occupid (Occupied)	Indicates if a cartridge is loaded in the drive (1) or not (0).
OccVald (Occupied Valid)	Indicates if the occupied information is reliable (1) or not (0).
Access	Indicates if the drive is accessible to the robot (1) or not (0).

5. To view additional drive information, press ↓ from the Drive Info Menu and then press ENTER to display the Drive Display screen. The following screen appears:



The following table lists some messages that can appear for the M2, Mammoth, and Mammoth-LT tape drives. For a complete list, refer to your drive's installation and operation manual, available in PDF format from www.exabyte.com.

M2, Mammoth, and Mammoth-LT drive display messages	
Tape drive status messages	
READY–NOTAPE	The drive is ready to accept a cartridge.
LOADING	The drive is loading the tape.
READY–TAPE	The drive has successfully loaded the tape and is ready for read/write operations.
EJECT	The unload button was pressed. The drive ejects the cartridge as soon as it finishes its current operation.
EJECT–PREVNT	The software has disabled the eject function with the PREVENT/ALLOW MEDIA REMOVAL command. The drive will rewind and unload the tape, but will not eject the cartridge.
ILLEGAL TAPE	The drive detected an incompatible cartridge and ejected it.
Tape motion messages	
READ +	The drive is reading or writing data. The + sign appears when the drive is in compression mode.
WRITE+	
PROTECTED	The drive cannot write data because the data cartridge is write-protected.
ILLEGAL WRT	The drive cannot write to the type of data cartridge inserted. This message remains until an unload/eject operation is performed.
SEARCH	High-speed search is in progress.
REWIND	Rewind is in progress.
ERASE	The drive is erasing data on the tape.

M2, Mammoth, and Mammoth-LT drive display messages	
Drive display messages	
FORMAT	The drive is repartitioning the tape to the requested format.
WORN TAPE	The tape currently in the drive has exceeded the drive's maximum tape passes threshold and must be replaced.
Cleaning messages	
CLEAN SOON[a]	The drive should be cleaned at the next convenient time.
CLEANING...	Cleaning is in progress.
DEPLETED	The cleaning tape in the cartridge is depleted and the drive will eject it. Use a new cleaning cartridge.
CODE LOAD FAIL	These messages appear in sequence after the code load failed.
RETRY CODE LOAD	
MAKE CODELOAD TP	The drive is making a code load tape.

[a] These messages appear when non-SmartClean media is used and the drive is cleaned using an Exabyte Mammoth Cleaning Cartridge.

The following table lists some messages that can appear for the AIT-2 tape drive.

AIT-2 drive display messages	
Tape drive status messages	
RdyNoTpe (Ready-no tape)	The drive is ready to accept a cartridge.
Loading	The drive is loading the tape.
Rdy-Out (Ready out)	The cartridge is ejected from the drive.
RdyTape (Ready tape)	The drive has successfully loaded the tape and is ready for read/write operations.
Tape motion messages	
Reading	The drive is reading or writing data.
Writing	
TpMtion (Tape in motion)	The drive is moving tape.
Unloadg (Unloading)	The drive is unloading tape.
Cleaning messages	
MustCln (Must clean)	The drive should be cleaned at the next convenient time.
Clning (Cleaning)	Cleaning is in progress.

Monitoring the drive LEDs

> ➤ **Important** You must park the robot and remove the cartridge magazine as described on page 48 before you can view the drive's LEDs.

The drive faceplate has three LEDs for indicating the drive's operational status.

The following tables show the most frequent LED states and the conditions they indicate. You may see other LED activity (random flashing, steady on, and so forth). For a detailed description of the LEDs, refer to the installation and operation manual for your drive.

M2, Mammoth, and Mammoth-LT LEDs

LED states	Condition
All LEDs on	The drive was reset or it is performing its power-on self-test.
Top LED on	The drive requires cleaning or a cleaning is in progress.[a]
Top LED flashing	Hardware error or the drive failed POST.
Middle LED on	A tape is loaded and the drive is ready to perform tape motion activities.
Bottom LED flashing	Tape motion. A fast flash indicates high-speed tape motion.

[a] For M2 only, manual cleaning is required when standard AME media has been used. Cleaning is automatic when AME with SmartClean cartridges are used exclusively.

AIT-2 LEDs

LED states	Condition
Busy (left) LED on	SCSI activity is occurring.
Tape (middle) LED on	Tape is loaded.
Status (right) LED on	Cartridge is write-protected.
Tape LED is flashing (3.5 seconds on; 0.5 seconds off)	Error has occurred.
Tape LED is flashing (0.25 seconds on; 0.25 seconds off)	Tape is loading or unloading.
Status LED is flashing (3.5 seconds on; 0.5 seconds off)	Cleaning required.[a]

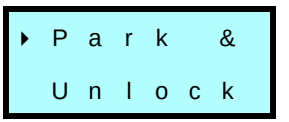
[a] Manual cleaning is required when the drive has been operating in extreme environmental conditions.

Ejecting a cartridge manually

If a problem occurs that requires intervention, you may need to manually eject a cartridge from the drive. Manually remove a cartridge as follows:

1. Park the robot and remove the magazine, as described below:

a. From the Main Menu, press ↑ or ↓ until the following screen appears:



b. Press ENTER. The following message flashes on the screen:

```
Unlock Magazine Yes:ENTER No:ESCAPE
```

c. Press ENTER to unlock the magazine. The robot parks at the top of the autoloader and the magazine's solenoid releases.

d. Grasp the magazine at the top (near cartridge slot 7) and pull out.

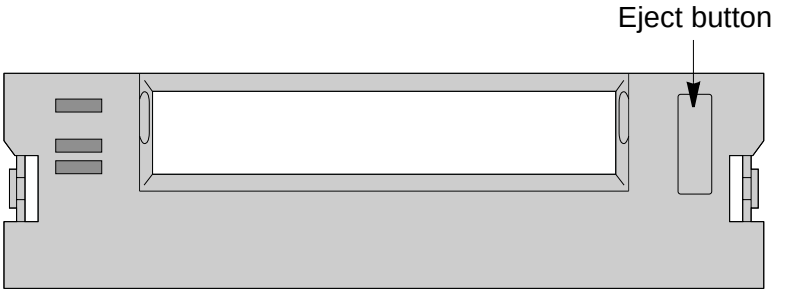
> **CAUTION**
>
> Do not force the magazine out of the autoloader. Doing so may damage the magazine or the robot.

2. Press the eject button on the drive's faceplate.

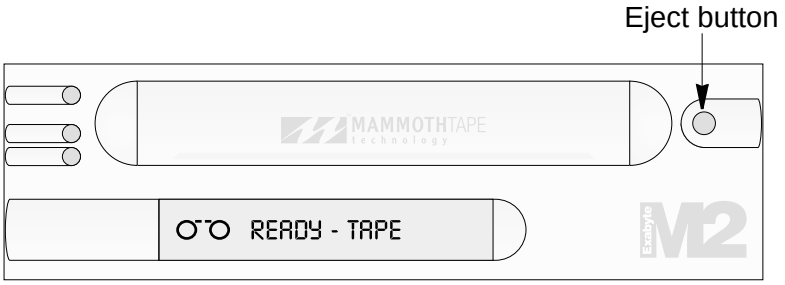
> **CAUTION**
>
> Do not touch the Magazine Present sensor when pressing the eject button.

3. Remove the cartridge from the drive.

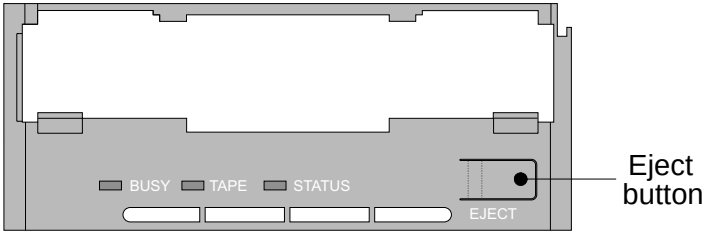
The following figures show the location of the eject button on the drives.



Mammoth and Mammoth-LT drive faceplate



M2 drive faceplate



AIT-2 drive faceplate

6 Diagnostics and Firmware

This chapter describes how to do the following:

- Connect to the Console interface
- Upgrade autoloader firmware via Console
- Create a diagnostic listing via Console
- View the LCD password via Console
- Communicate with the tape drive

This chapter uses the following conventions:

- Keys shown boldfaced in brackets (for example, **[Enter]**), are keys you press on your host computer's keyboard.

- Words shown in Courier, for example `help`, are commands you type.

Connecting to the Console interface

This section describes how to access the Console interface, the autoloader's internal diagnostics firmware. You can use Console for upgrading firmware, creating a diagnostic listing, and viewing the LCD password.

Before accessing Console, you must have the following:

- A 9-pin straight-through serial cable (not a null modem cable)
- A host computer that uses an RS232 serial port
- Terminal emulation software, such as HyperTerminal

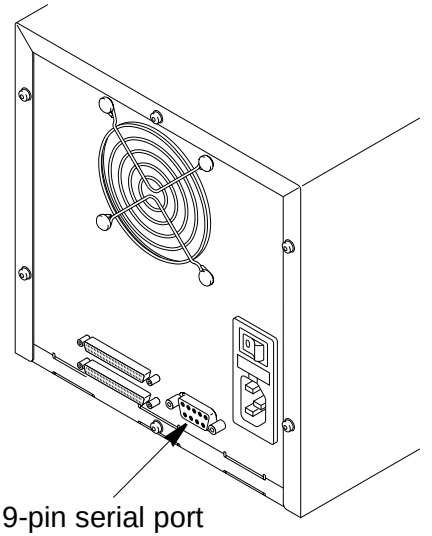
Note: Exabyte recommends using HyperTerminal, a standard communications package available with Microsoft Windows®.

Connecting the serial cable

1. Power off the autoloader and disconnect the power cord.

2. Connect the 9-pin cable to the back of the autoloader and to the host computer. The following figure shows the location of the 9-pin serial port on the back of the autoloader.

3. Connect the power cord and power on the autoloader.

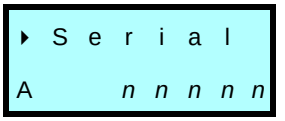


Setting the autoloader's baud rate

Before accessing Console, you must set the baud rate for the autoloader so that it matches the host computer's baud rate.

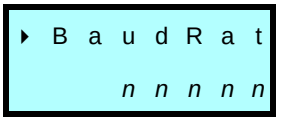
To set the autoloader's baud rate:

1. From the Main Menu, scroll until you see the following screen:



2. In the example above, *nnnnn* is the current baud rate for the autoloader.

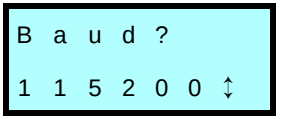
3. To change the autoloader's baud rate, press ENTER. The following screen appears:



4. Press ENTER. The following message flashes on the screen:

   `Select serial port baud rate for Auto Loader`

   Then, the following screen appears:



5. Press ↑ or ↓ until you see the baud rate that matches the baud rate set on the host, and then press ENTER.

Accessing Console using HyperTerminal

Note: These instructions assume you are using HyperTerminal, a communications package available with Microsoft Windows. If desired, you can use a different terminal emulation software package.

To access Console using HyperTerminal:

1. From your computer, launch HyperTerminal.

2. In HyperTerminal's Connection Description screen, enter a name and choose an icon for this communications session.

3. In HyperTerminal's Connect To screen, choose the communications port you are using from the Connect Using field. Click OK.

4. In the Properties screen, make sure the fields contain the following values, then click OK.

   - *Bits per second:* (baud rate of the computer)
   - *Data bits:* 8
   - *Parity bits:* none
   - *Stop bits:* 1
   - *Flow control:* none

5. Check the ASCII setup from HyperTerminal:

   a. From the File menu, select Properties.

   b. In the Properties screen, select the Settings tab.

   c. In the Emulation mode field, select "ANSI."

   d. Click on the ASCII Setup button.

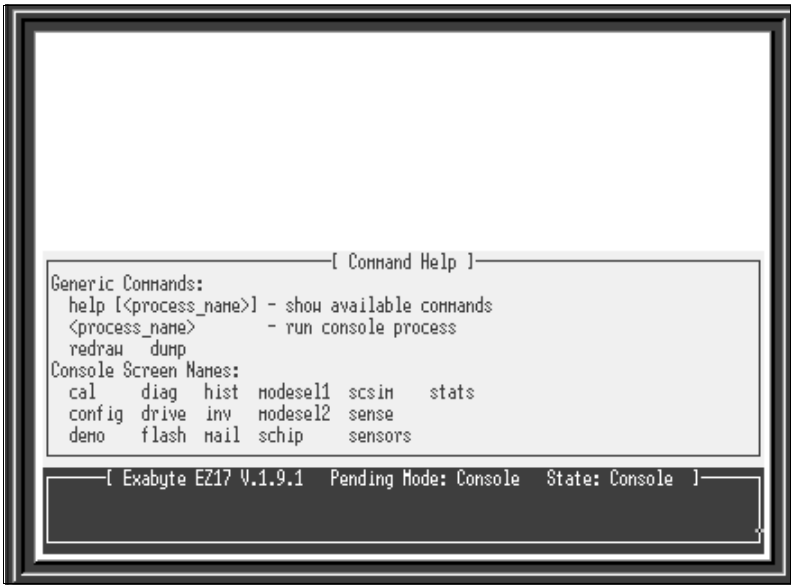
   e. In the ASCII Setup screen, make sure none of the boxes have check marks. Uncheck the boxes, if necessary.

   f. Click OK in the ASCII Setup screen.

   g. Click OK again in the Properties screen.

6. The Console program should now appear in HyperTerminal's main window. If necessary, type `redraw` and then press **[Enter]** to refresh the screen.

7. If desired, type `help` and then press **[Enter]** to display Console's Help screen, as shown in the following figure.

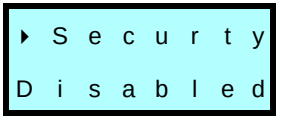


Note: If garbled characters or no characters appear on the screen, make sure you have the same baud rate set for the host as you do for the autoloader.

Setting the autoloader to Console mode

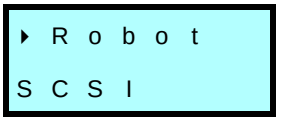
Set the autoloader to Console mode by following these steps:

1. Press MENU. The following screen appears:



2. Disable LCD security if it is enabled, as described on page 42.

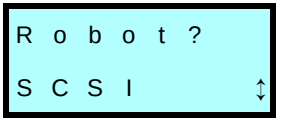
3. Press ↑ or ↓ to scroll through the Main Menu until you see the following screen:



4. Press ENTER. The following message flashes on the screen:

   `Select I/F that controls robotic motions`

   Then, the following screen appears:



5. Press ↑ or ↓ until you see Console and press ENTER to select it.

Upgrading firmware via Console

These instructions describe how to upgrade the autoloader firmware using the Console.

> **CAUTION**
>
> Do not upgrade firmware unless Exabyte Technical Support has advised you to do so. If performed improperly, the upgrade procedure can render your device inoperable. Consult with Exabyte Technical Support before performing an upgrade.
>
> Because of memory limitations, the autoloader cannot validate the new firmware data before erasing and reprogramming the flash EEPROM. If the checksum calculated by the autoloader does not match the embedded checksum, the new firmware will be unusable. Therefore, *before* performing the write firmware operation, use the READ BUFFER or READ FIRMWARE SCSI command to create a copy of your current firmware.

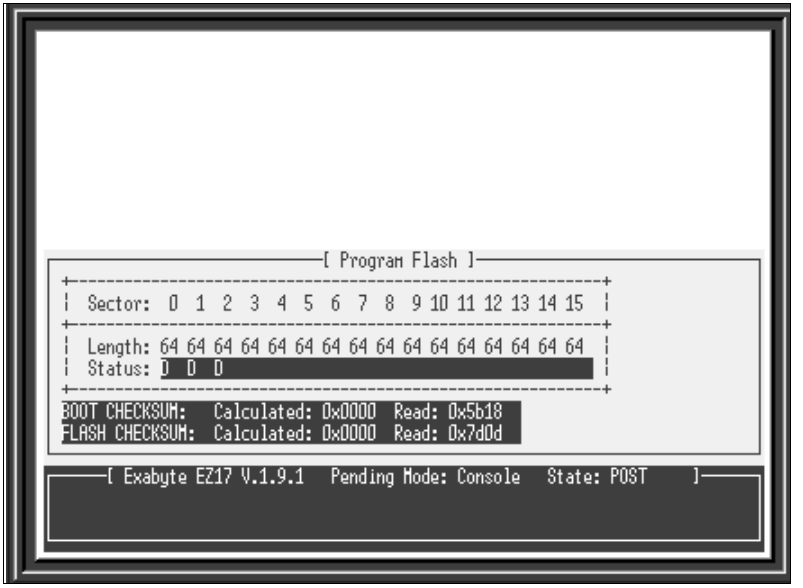
To upgrade the autoloader firmware:

1. Obtain new firmware for the library. You can download new firmware from Exabyte's web site (www.exabyte.com), or you can contact Exabyte Technical Support.

2. Access Console by following the steps in "Connecting to the Console interface" on page 90.

3. If desired, you can use the SCSI READ BUFFER command to copy the current firmware to disk. To do this, use a software application that can issue SCSI commands. For more information about the SCSI commands, refer to the SCSI reference for your autoloader.

4. From Console, type `flash` and press **[Enter]**. This displays the Flash screen, as shown below.



5. Type `pflash` and press **[Enter].** The autoloader erases the flash EEPROM sectors and then displays the following prompt:

   `Begin XMODEM download of flash code.`

6. Use your terminal emulation software to specify the source location (path and filename) of the new firmware. For HyperTerminal, follow these steps:

   a. Select the Transfer menu.

   b. Select Send File.

   c. In the Send File screen, enter the path and file name of the firmware or click on the Browse button to locate the file. Select XModem as the protocol.

   d. Click on Send.

The system initiates the firmware upgrade and displays its progress on the screen. When the upgrade is successfully completed, the autoloader resets.

CAUTION

Do not attempt to perform autoloader operations or power down the autoloader until after the autoloader automatically resets.

Creating a diagnostic listing via Console

If you report a problem to Exabyte Technical Support, you may be asked to create an autoloader diagnostic listing (also called a *dump*) via the Console interface. A diagnostic listing is created when you use a terminal emulation program (such as HyperTerminal) to send an ASCII text copy of the diagnostic buffer from the autoloader to the host computer. This buffer information can be used by support personnel to troubleshoot incidents with the autoloader.

Note: These instructions assume you are using HyperTerminal, a communications package available with Microsoft Windows. If desired, you can use a different terminal emulation software package.

To create a diagnostic listing:

1. Access Console by following the steps in "Connecting to the Console interface" on page 90.
2. Type `dump` and press **[Enter]**.
3. Select the Transfer menu, then select Capture Text.
4. In the Capture Text screen, enter the path and filename for the ASCII text file and press **[Enter]**.
5. Press **[Enter]** again to start transferring the ASCII text file.
6. When the transfer is complete, select the Transfer menu, then select Capture Text and Stop.

Viewing the LCD password via Console

You can view the LCD password from the Configuration Information screen in the Console interface.

To view the LCD password:

1. Access Console by following the steps in "Connecting to the Console interface" on page 90.

2. Type `config,` then press **[Enter]**. The Configuration Information screen appears, as shown below. The password appears next to the LCD password field.

Communicating with the tape drive

These instructions describe how to establish communications with the M2, Mammoth, or Mammoth-LT tape drive using the autoloader's serial port and Exabyte's Monitor Software for Windows program, so you can upgrade the drive firmware or create a diagnostic listing.

Note: If you need to establish communications with an AIT-2 drive, contact Exabyte Technical Support or go to the Sony web site at:
www.storagebysony.com/support/consumer.asp

Setting up the hardware and software

Obtain the following:

- A host computer that uses an RS232 serial port.
- A straight-through 9-pin serial cable (not a null modem cable).
- Windows 95, 98, 2000, or NT 4.0.
- The M2 or Mammoth Monitor program. Exabyte provides a Windows-based drive monitor software program that you can download from Exabyte's web side (www.exabyte.com) or request from Exabyte Technical Support.

Note: If you will be upgrading drive firmware, you can download new firmware from Exabyte's web site (www.exabyte.com) or you can contact Exabyte Technical Support for firmware.

Establishing drive communication

To establish communication with the drive over the autoloader's serial port:

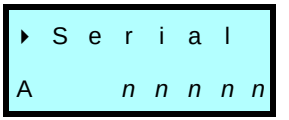
1. Connect the serial cable to the autoloader and host computer (see page 90).

2. Disable security if it is enabled (see page 42).

3. Set the autoloader to LCD mode (see page 39).

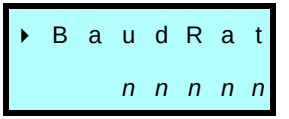
   Note: If the autoloader is in an error state or if the magazine is removed, you can connect the serial port to the drive even if the autoloader is not in LCD mode.

4. From the Main Menu, press ↑ or ↓ until you see the following screen:

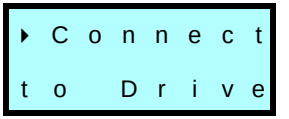
   

   In the above example, *nnnnn* is the current baud rate for the autoloader.

5. Press ENTER. The following screen appears:

6. Press ↑ or ↓ until you see the following screen:

7. Press ENTER. The following message flashes on the screen:

```
Connect serial port to drive?
```

Press ENTER to connect the serial port to the drive.

➤ **Important** When you connect the serial port to the drive, the autoloader automatically sets the serial port baud rate to 9600. You must also set the terminal emulation program's baud rate to 9600.

Note: While the serial port is being used to communicate with the drive, the following message flashes on the screen:

```
Press ENTER to return serial port connect
to Auto Loader
```

You cannot perform other LCD operations until you connect the serial port to the autoloader.

8. When you are ready to resume autoloader operations, press ENTER to disconnect the serial port from the drive.

Using the M2 or Mammoth Monitor software

To use the M2 or Mammoth Monitor software:

1. If necessary, download the M2 or Mammoth Monitor software from Exabyte's web site. Make sure you download the version that matches your operating system.

   Note: The Mammoth Monitor software is for both Mammoth and Mammoth-LT. The M2 Monitor software is only used with M2. Make sure you download the correct software for your drive.

2. Install the M2 or Mammoth Monitor on your host computer and then launch the software.

3. Refer to the Help file provided with the monitor software for instructions on setting up and using the program, or to upload firmware and perform diagnostics.

> **CAUTION**
>
> Do not upgrade firmware unless Exabyte Technical Support has advised you to do so. If performed improperly, the upgrade procedure can render your device inoperable. Consult with Exabyte Technical Support before performing an upgrade.

7 Troubleshooting

This chapter provides a list of suggestions for solving problems that may occur when you are installing and operating the autoloader and the enclosed drive. The instructions in this chapter are basic troubleshooting guidelines. For more advanced troubleshooting, contact your service provider or Exabyte Technical Support.

This chapter is divided into the following sections:

- Problems with autoloader installation
- Problems with drive operation
- Problems with autoloader operation

Note: If an error code is displayed on the LCD, refer to Appendix C. If the LEDs on the drive are flashing, see page 85.

Problems with autoloader installation

If your autoloader and application software are not communicating after installation, check the following:

- ✔ **SCSI IDs.** Make sure that the SCSI IDs you selected for the drive and autoloader are not the same as an ID used by any other SCSI device on that bus, including the SCSI adapter card. Refer to page 34 for information about setting the SCSI IDs.

- ✔ **SCSI cabling.** Make sure that all SCSI cables are securely connected at both ends.

- ✔ **Single-ended, LVD, and HVD devices.** Make sure all devices on the bus are all single-ended or LVD or all differential. You can connect single-ended and LVD devices to the same bus. However, mixing the two types of devices results in all devices on the bus operating as single-ended devices. These devices include the controller cards, cables, and terminators.

> **CAUTION**
>
> Connecting a single-ended or LVD device to an HVD SCSI bus may hang the SCSI bus.

- ✔ **SCSI cable lengths**. Make sure the SCSI cabling does not exceed maximum lengths (see page 126).

- ✔ **Termination**. Make sure your bus is properly terminated as described on page 22. Make sure that you use the correct terminator (see page 127). If another SCSI device previously terminated the SCSI bus and is no longer at the physical end of the bus, be sure to remove the terminators from that device.

- ✔ **Compatibility.** Make sure that your drive and autoloader are compatible with the application software you plan to use. Visit Exabyte's website at www.exabyte.com for compatibility information.

- ✔ **SCSI adapter card installation.** Make sure that you installed your SCSI adapter card correctly. Refer to the documentation that came with your card for installation and troubleshooting instructions. Pay special attention to steps describing setting various jumpers and switches on the card. Make sure that the card is properly seated.

- ✔ **Software installation.** Make sure that your application software is installed and configured correctly. Refer to the documentation that came with your software. Pay special attention to steps describing configuring the software for use with the autoloader and drive.

- ✔ **Control mode.** Make sure the autoloader is operating in the correct control mode. For most applications, the control mode should be set to SCSI mode. See page 38 for more information.

After checking the items above, reset the autoloader as described on page 72.

Problems with drive operation

If you have been successfully operating the application software and autoloader in the past, but are now experiencing problems reading and writing data, check the following:

- ✔ **Write-protect switch**. If you are writing data, make sure the cartridge is write enabled (see page 18).

- ✔ **Cartridge type**. Use the appropriate cartridges for your drive. See "Selecting cartridges" beginning on page 11 for information about selecting the appropriate cartridges for the drive in your autoloader. Because of media management and application software issues, do not mix different types of cartridges in the autoloader. If you must mix cartridge types, contact your software vendor.

- ✔ **Cartridge age**. If the cartridge has been in use for a long time or if it has been used frequently, try using a new cartridge.

- ✔ **Cleaning**. Clean the drive as required. See "Cleaning the drive" beginning on page 76 for more information. Make sure you are using the recommended cleaning cartridge for your drive.

Problems with autoloader operation

If the autoloader has been successfully operating in the past, but is now experiencing problems, check the following:

- ✔ **Control mode**. If you are using an application software package to control robot operations, the autoloader must be set to SCSI mode. See page 38 for more information. If you are operating the autoloader in Sequential mode, see page 53.

- ✔ **Security**. Make sure that security is set correctly for the operation you are trying to perform. If security is enabled, you cannot perform many operations on the LCD and you cannot remove the magazine. Security can be enabled from the LCD (see page 41) or from your application software with a SCSI command.

- ✔ **Robot operation**. You can use the selections in the Command Menu and the Demo Menu to determine if the robot is functioning properly. See page 69.

Notes

8 Service

This chapter describes the following:

- Cleaning requirements for the autoloader
- Using touch-up paint on the housing
- Returning the autoloader for service

Cleaning requirements

➤ **Important** To protect the internal components from dust, keep the autoloader magazine in place.

The only autoloader component that should be cleaned is the drive. Instructions for cleaning the drive begin on page 76.

CAUTION

The autoloader's internal components are lubricated at the factory and should not be cleaned or relubricated.

Using touch-up paint on the housing

A paint kit is available for touching up nicks and scratches on the finish. To order touch-up paint, contact Exabyte (see "Contacting Exabyte" on the inside back cover).

Returning the autoloader for service

If you need to return the autoloader to the factory for service, contact your service provider. If your service provider instructs you to return the autoloader directly to Exabyte, contact Exabyte Service to obtain a Return Materials Authorization (RMA) number and the shipping address (see "Contacting Exabyte" on the inside back cover). When you have the RMA number, follow the packing instructions in this section.

Preparing the autoloader for shipping

Use the original packing materials to pack the autoloader (shipping container, packing pieces, and antistatic bag). You will also need packing tape.

CAUTION

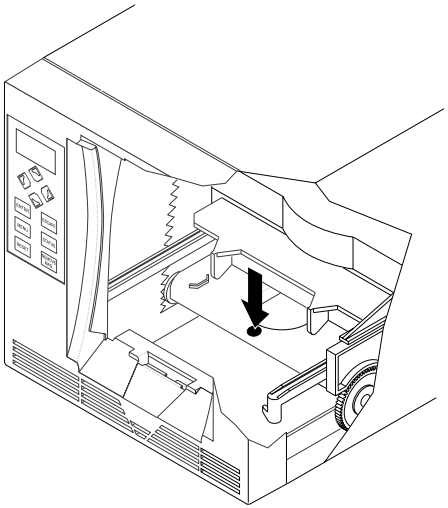
To avoid damaging the autoloader and voiding your warranty, be sure to use the original shipping materials (or replacement materials obtained from your vendor) when repacking and shipping the autoloader. Do not use the shipping carton and packing materials to ship items other than an autoloader.

To prepare the autoloader for shipping:

1. Remove the magazine as described on page 48.
2. Remove all cartridges from the magazine. Make sure the robot and the drive do not contain cartridges.
3. Power off the autoloader.
4. Disconnect the power cord and any SCSI cables or terminator. Do not ship these items if you are returning the autoloader to the factory.

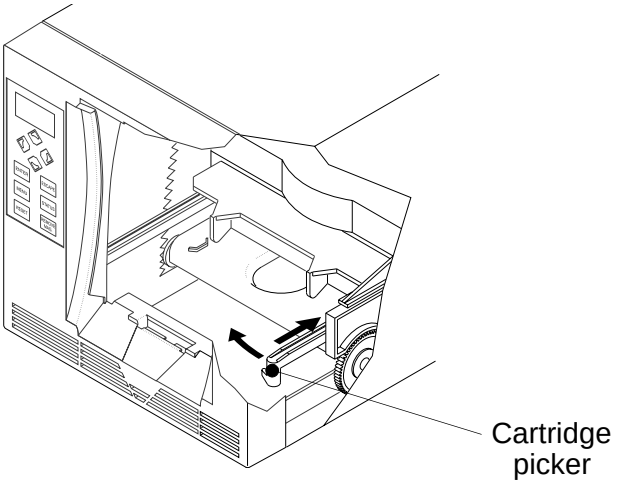
Installing the shipping braces

1. If necessary, manually push the robot down to the bottom of the autoloader.

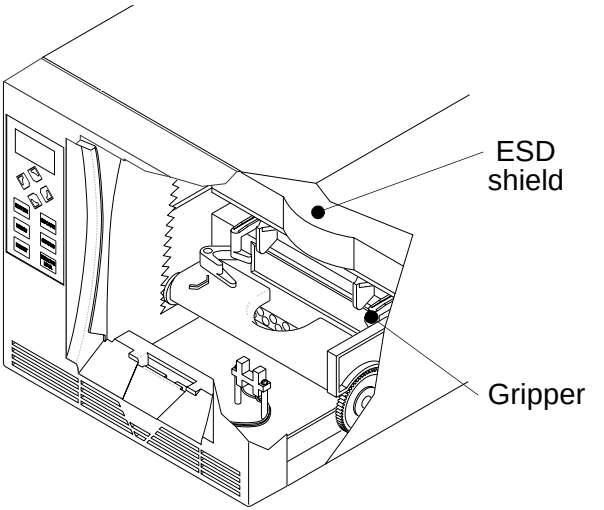


2. Push the picker all the way into the robot as follows:

a. Push the picker toward the back of the autoloader until it stops.

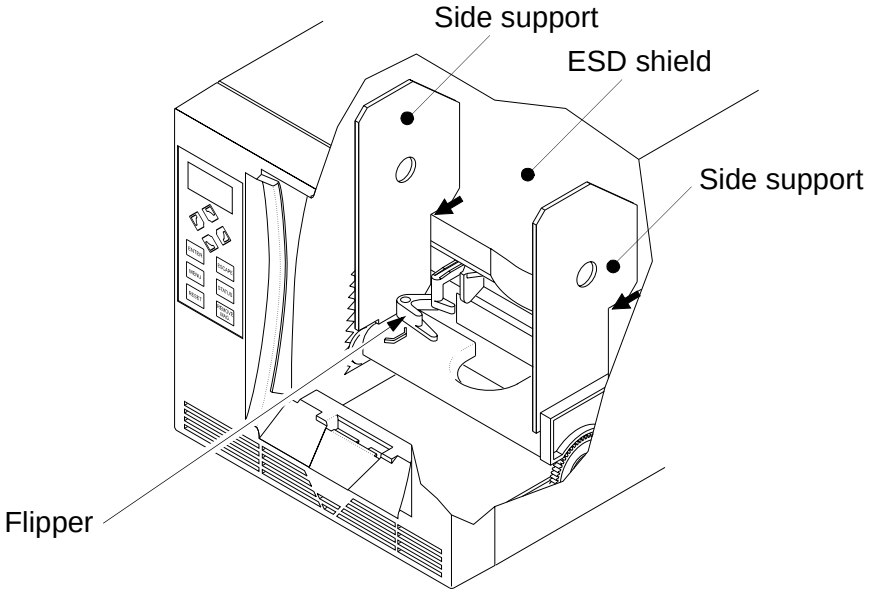


b. Make sure the picker cannot be pushed any further and the gripper is under the robot's ESD shield.

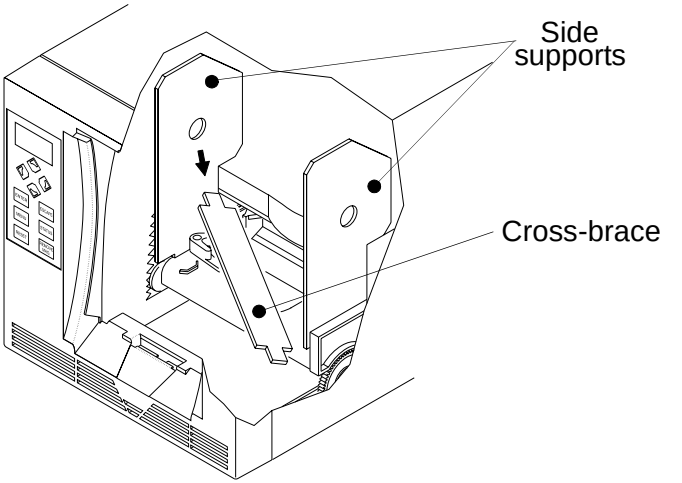


3. Angle one side support in through the front of the autoloader and then place it between the side of the autoloader and the flipper. Be sure to push the side supports all the way in so they rest on the ESD shield, as shown in the following figure.

4. Insert the other side support into the autoloader.

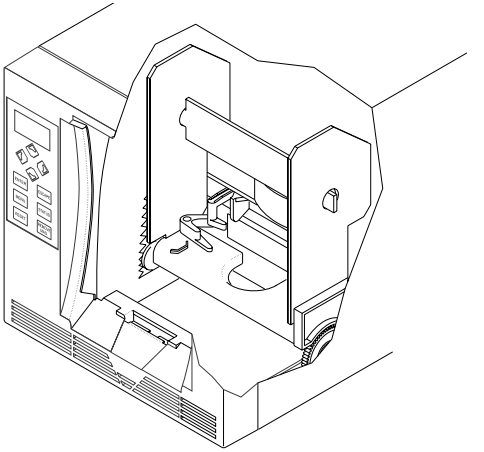


5. Insert one end of the cross-brace into the hole on one of the side supports.



6. Insert the free end of the cross-brace into the remaining side support. Your packing pieces should look like the following figure.

7. Reinstall the magazine as described on page 50.



Packing the autoloader

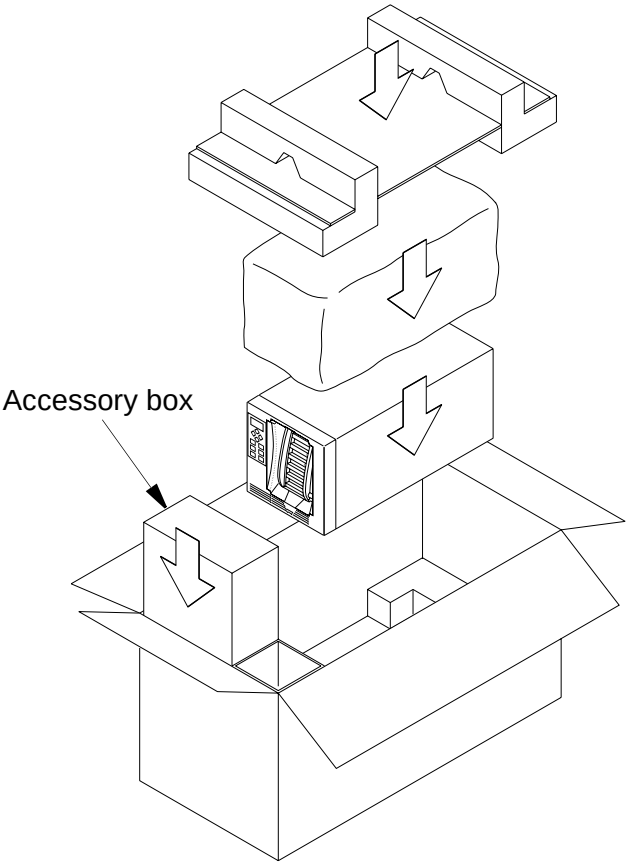
Refer to the figure on the next page and pack the autoloader as follows:

1. Place the autoloader on the cushion in the bottom of the box.
2. Insert the empty accessory box into the autoloader box.

> ➤ **Important** If you are shipping the autoloader for repairs, do not include the accessories.

3. Place the antistatic bag over the autoloader, then place the autoloader into the box.

4. Place the top cushion over the autoloader.



5. Place any necessary paperwork in the top of the autoloader box.

6. Close and seal the box.

7. Place the shipping label on the box.

A Specifications

This appendix provides overall specifications for the autoloader, media capacities, media compatibility, power cord requirements, SCSI cable specifications, SCSI terminator requirements, and SCSI adapter specifications.

Overall specifications for the autoloader

The following table provides general specifications for the autoloader.

Interface specifications	
Interface	SCSI-2, Ultra, or Ultra2
Capacity and speed	
Maximum capacity (EZ17M M2 autoloader)	1.05 terabytes (assuming a 2.5:1 compression ratio)
Maximum capacity (EZ17M Mammoth autoloader)	280 gigabytes (assuming a 2:1 compression ratio)
Maximum capacity (EZ17M Mammoth-LT autoloader)	196 gigabytes (assuming a 2:1 compression ratio)
Maximum capacity (EZ17A AIT-2 autoloader)	910 gigabytes (assuming a 2.6:1 compression ratio)

Capacity and speed *(continued)*	
Maximum transfer rate (EZ17M M2 autoloader)	30 MB per second (assuming a 2.5:1 compression ratio)
Maximum transfer rate (EZ17M Mammoth autoloader)	6 MB per second (assuming a 2:1 compression ratio)
Maximum transfer rate (EZ17M Mammoth-LT autoloader)	4 MB per second (assuming a 2:1 compression ratio)
Maximum transfer rate (EZ17A AIT-2 autoloader)	15 MB per second (assuming a 2.6:1 compression ratio)
Size and weight	
Size	8.4 high × 8.3 wide × 18.3 long (inches) (21.3 × 21.1 × 46.2 cm)
Weight	9.8 kg (21.5 lbs)
Operating environment	
Ambient temperature	+ 5° C to + 35° C (+ 41° F to + 95° F)
Relative humidity	20% to 80%, noncondensing
Wet bulb	26° C (79° F) max
Power	
Input voltages	Accepts 100 to 240 VAC at 50 to 60 Hz; automatic input voltage selection
Power consumption	23 watts (average AC true power, idle) 29 watts (average AC true power, operating) 37 watts (maximum AC true power, operating)
BTU output (EZ17M autoloader)	126 BTUs per hour (average heat output)
BTU output (EZ17A AIT-2 autoloader)	99 BTUs per hour (average heat output)

Media capacities

This section provides the maximum capacities of the media.

AME with SmartClean media for M2 drives

The following table provides the approximate capacities in gigabytes (GB) for each AME cartridge with SmartClean.

	Maximum capacity	
Tape length	**Native**	**Compressed[a]**
225 meters	60 GB	150 GB
150 meters	40 GB	100 GB
75 meters	20 GB	50 GB

[a] Assumes a 2.5:1 compression ratio. Actual compressed capacity varies depending on the type of data being recorded.

AME media for Mammoth or Mammoth-LT drives

The following table provides the approximate capacities in gigabytes (GB) for each Mammoth cartridge.

	Maximum capacity	
Tape length	**Native**	**Compressed[a]**
170 meters[b]	20 GB	40 GB
125 meters	14 GB	28 GB
45 meters	5 GB	10 GB
22 meters	2.5 GB	5 GB

[a] Assumes a 2:1 compression ratio. Actual compressed capacity varies depending on the type of data being recorded.

[b] Mammoth-LT does not support 170 meter cartridges.

AME media for AIT-2 drives

The following table provides the approximate capacities in gigabytes (GB) for each AIT-2 cartridge.

	Maximum capacity	
Tape length	**Native**	**Compressed[a]**
230 meters	50 GB	130 GB
170 meters	36 GB	94 GB

[a] Assumes a 2.6:1 compression ratio. Actual compressed capacity varies depending on the type of data being recorded.

Media compatibility

The following table summarizes which media is compatible with which drive.

Cartridge type	Tape length (in meters)	Compatible with …			
		Mammoth-LT[a]	Mammoth[a]	M2	SDX-500C
AME with SmartClean™	75	No	No	Read/ Write	No
	150	No	No	Read/ Write	No
	225	No	No	Read/ Write	No
Standard AME	22	Read/ Write	Read/ Write	Read/ Write[b]	No
	45	Read/ Write	Read/ Write	Read/ Write[b]	No
	125	Read/ Write	Read/ Write	Read/ Write[b]	No
	170	No	Read/ Write	Read/ Write[b]	No
AIT-2	170	No	No	No	Read/ Write
	230	No	No	No	Read/ Write

[a] For the purposes of data interchange, Mammoth and Mammoth-LT can read, but not write, metal particle (MP) media written in one of the following formats: 8500c, 8500, or 8200.

[b] For optimal tape drive performance and reliability, Exabyte recommends only SmartClean media for M2 tape drives and libraries. M2 can use other AME media, but will require regular cleaning with an Exabyte Mammoth cleaning cartridge. For the purposes of data interchange, M2 can read, but not write, standard AME tapes written using the original Mammoth data format.

Power cord requirements

The autoloader is shipped with a seven-foot (2.1 meter), 18 AWG, 3-conductor AC power cord for 120 volt use in the United States and Canada. The power cord has a molded NEMA 5-15P male connector on one end and a molded IEC type CEE-22 female connector on the other end. The power cord is UL Listed and CSA Certified.

Note: If you are planning to use an input voltage other than 120 volts AC or if you plan to use the autoloader outside of the United States or Canada, you must supply your own power cord.

U.S. and Canadian 220 VAC power cord

- The power cord must have a molded NEMA 6-15P attachment plug on one end.
- The power cord must have a molded IEC 320 female connector on the other end.
- The cordage must be an SJT or SVT type, 3-conductor, 18 AWG minimum.
- The power cord must comply with local electrical code.

International 230 VAC power cord

- The power cord must have an attachment plug of the proper type, rating, and safety approval for the intended country.
- The power cord must have an IEC 320 female connector on one end.

- The cord must be harmonized to CENELEC publication HD-21. The electrical characteristics and rating must be minimum H05VVF3G0.75 (6 A).

SCSI cable specifications

When selecting a cable to connect the autoloader to the SCSI bus, select a cable that complies with the SCSI-3 specification and meets the requirements listed in the following table.

➤ **Important** To comply with the regulations and standards listed at the front of this book, all SCSI cables you use with the autoloader must be properly shielded.

	Narrow SCSI configuration	Wide SCSI configuration
Connector type (to autoloader)	50-pin, high-density, shielded, male connector and 50-pin to 68-pin adapter[a]	68-pin, high-density, shielded, male connector
Recommended impedance	Single-ended: 132 ohms LVD: 110 ohms HVD: 88 ohms	

[a] A SCSI adapter is required when connecting a narrow SCSI cable to the autoloader (see page 128).

Cable length for single-ended configurations

If your host can transfer data at more than 5 MB per second, the total length of all internal and external cables should not exceed 3.0 meters (9.8 feet).

If your host limits data transfers to 5 MB per second or less, the total length of all internal and external cables should not exceed 6.0 meters (19.7 feet).

Cable length for LVD configurations

The total length of all internal and external cables on the SCSI bus should not exceed 25 meters (82 feet) in a point-to-point connection. If you have more than two devices on the bus, the maximum cable length is 12 meters (39 feet).

Cable length for HVD configurations

The total length of all internal and external cables on the SCSI bus should not exceed 25 meters (82 feet).

SCSI cable length

1. Add the lengths of all the external SCSI cables on the bus.
2. To that total, add 0.7 meters (27.2 inches) for the SCSI cable inside the autoloader.
3. To that total, add the internal cable lengths for any other SCSI devices on the bus.

SCSI terminator specifications

The SCSI terminator must match the SCSI bus configuration (that is wide or narrow, single-ended, HVD, or LVD). In addition, all termination must be external. Do not use internal terminators to terminate the autoloader or the tape drive.

➤ **Important** Exabyte recommends using active termination. Exabyte testing has shown that older passive termination does not provide rising edge transitions that are fast or clean enough at fast SCSI speeds.

To ensure proper performance of the autoloader and tape drive, Exabyte recommends one of the following external terminators. The terminators for single-ended, HVD, and LVD buses are not identical. Do not mix the variants.

Terminator specifications	
Wide, single-ended	AMP Amplimite 869516-1
Wide, HVD	AMP Amplimite 869515-1
Wide, LVD	AMP Amplimite 796051-1 (SE/LVD Multi-mode)

SCSI adapter specifications

If you plan to connect the autoloader to a narrow SCSI bus, you need one or two SCSI cable adapters. The type of adapter you need depends on how you are setting up your SCSI bus. If you are using the SCSI cable supplied with the autoloader and you are connecting to a narrow host, you need a 68-pin female to 50-pin male adapter.

The following adapters are available from Exabyte:

- Single-ended, 68-pin female to 50-pin male adapter, 320224
- Single-ended, 68-pin male to 50-pin female adapter, 325785
- HVD, 68-pin female to 50-pin male adapter, 320225

➤ **Important** The adapter you use must terminate the unused data lines.

B SCSI Configuration

This appendix provides an overview of the SCSI interface and provides some general guidelines for connecting the autoloader to the SCSI bus.

SCSI components

The SCSI system consists of the following components:

- **Initiator.** The host computer system acts as the initiator of commands. It consists of the application software, the operating system, the device driver, and the SCSI adapter card.
- **Bus.** The SCSI cables connected to the adapter card and to the autoloader (as well as other devices on the bus) provide a pathway (or "bus") for passing commands.
- **Targets.** The autoloader and the tape drive are peripheral devices (or targets) that are capable of receiving commands from the host. Up to sixteen devices (including the host computer) can be connected to the wide SCSI bus and up to eight devices can be connected to the narrow SCSI bus.

Considerations for installing the autoloader on the SCSI bus

This section provides the basic guidelines and considerations for setting up the autoloader on the SCSI bus.

LVD SCSI

The autoloader uses an LVD (low-voltage differential) SCSI configuration. Every SCSI device attached to the SCSI buses connecting to or from the autoloader must also be LVD.

Note: Although LVD SCSI is compatible with single-ended SCSI, Exabyte does not support single-ended devices on the autoloader's LVD SCSI bus.

Do not connect the LVD autoloader to a high-voltage differential (HVD) SCSI bus.

Wide SCSI

The autoloader is available in a wide configuration only. If desired, you can attach the autoloader and drive to a narrow SCSI bus using adapters available from Exabyte. However, attaching the drive to a narrow bus will significantly reduce performance.

If you want to connect the autoloader to a narrow SCSI bus, you must use a 50-pin to 68-pin LVD SCSI adapter. Make sure that the adapter terminates all unused data lines.

SCSI IDs

Each device on the SCSI bus must have a unique ID. The host computer uses these IDs to identify each device. The SCSI ID also determines which device has priority when more than one device is trying to communicate with the host. The lower the ID, the lower the priority of the device.

Note: The device's SCSI ID does not depend on physical location. For example, the last device on a multi-device SCSI bus can have a SCSI ID of 2.

The autoloader uses two SCSI IDs, one for the robot and one for the tape drive. Separate IDs allow the robot and tape drive to operate as independent devices, receiving different sets of SCSI commands from the host.

SCSI terminator

If the autoloader is the last device on the SCSI bus, you must terminate the bus by installing a pass-through terminator on one of the autoloader's SCSI connectors. Or, if there is an unused connector at the end of the SCSI cable, you can terminate the bus there. The autoloader does not supply terminator power.

➤ **Important** Exabyte recommends using active termination. Exabyte testing has shown that older passive termination does not provide rising edge transitions that are fast or clean enough at fast SCSI speeds.

Notes

C Error Codes

This appendix describes the error codes that appear on the autoloader's LCD (liquid crystal display).

Note: For information about SCSI error conditions (sense data), refer to the *Exabyte EZ17 Autoloader SCSI Reference*.

For information about drive errors, refer to the SCSI reference for your drive.

CAUTION

Some corrective actions advise you to reset the autoloader. Before resetting, make sure there is no SCSI activity on any connected SCSI bus, so you do not disrupt communications.

The following table lists the autoloader hardware error conditions in numerical order.

Error no.	Description	Corrective action
10	**Dropped a tape**. The robot dropped a cartridge.	**CAUTION:** Do not try to put the cartridge back in the robot picker. ▪ Put the cartridge back in the magazine if you know where it belongs. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
11	**Source empty**. There is no cartridge in the source location.	Install a cartridge in the source location or redirect the robot to another location.
12	**Dest full**. A cartridge already exists in the destination location.	Remove the cartridge from the destination or redirect the robot to another location.

Error no.	Description	Corrective action
13	**Put failure**. The robot could not place a cartridge because of mechanical problems.	▪ Make sure there is nothing blocking the robot or the tape drive. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
14	**Pick failure**. The robot could not pick a cartridge because of mechanical problems.	
17	**CHM full wrong time**. There was a cartridge in the robot at the wrong time.	▪ Make sure there is nothing blocking the robot or the tape drive. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
18	**Source inside drive**. The robot could not successfully pick a cartridge because it was still loaded in the tape drive.	

Error no.	Description	Corrective action
19	**Pick error**. The robot could not pick from a full cartridge slot.	▪ Remove the cartridge magazine and look for anything that might be obstructing the robot. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
24	**Cart present bad**. Cartridge present sensor error.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.

Error no.	Description	Corrective action
27	**Failed theta init**. Theta axis could not be initialized.	▪ Remove the magazine and look for anything that might be obstructing the robot or picker. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
28	**Failed picker init**. Could not initialize the reach axis.	
29	**Steppers failed init**. Could not initialize the theta axis or the reach axis.	
30	**Picker does not move**. The picker could not move along the reach axis.	▪ Remove the magazine and look for anything that might be obstructing the picker. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
31	**Picker failed home**. The picker could not return to the home position along the reach axis.	
33	**Picker snsr state bad**. The picker's sensor state is invalid.	
34	**Picker sensor failure**. The picker sensor(s) are defective.	
38	**Can't load drive**. The robot could not load the cartridge into the tape drive because of mechanical problems.	

Error no.	Description	Corrective action
41	**Theta home sensor**. Robot home sensor failure.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
42	**Slot detect failure**. The robot could not find the specified slot position.	
43	**Tray home sensr fail**. Tray home sensor failure.	
44	**Grip motion timeout**. Internal software error.	
45	**Theta motor slippage**. The robot had excessive slippage on its theta axis.	
48	**Theta move failure**. The robot had a positioning error while moving to pick a cartridge.	
69	**One or more tapes are inserted incorrectly.** A cartridge is upside down.	Remove the magazine and insert the data cartridge correctly. If the tapes are inserted correctly, but the autoloader continues to report this error message, press ENTER to override the error. Only use this override if you are positive that the cartridges are inserted correctly (see page 18). If you override the error and a cartridge is inserted incorrectly, you will receive a fatal error during operation.

Error no.	Description	Corrective action
71	**Parameter > limit**. Firmware error.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider. You may be asked to supply a diagnostic listing, and you may need new firmware.
72	**Magazine sensor fail**. Magazine present sensor failure.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.

Error no.	Description	Corrective action
75	**Internal S/W error**. Firmware error.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider. You may be asked to supply a diagnostic listing, and you may need new firmware.
77	**Interface disabled**. The autoloader was not in the correct control mode when the operator sent a command.	Make certain you have set the correct control mode. If it is, contact your service provider.
91	**Command aborted**. An operation was aborted from the LCD, through SCSI, or through the serial port while it was in progress.	No corrective action required.

Error no.	Description	Corrective action
97	**Drive not installed**. There is not a tape drive installed.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider. The cable connection between the tape drive and the autoloader may be loose.
130 **131** **132** **133** **134** **135** **136** **137**	**SCSI chip error; SCSI unexpected int; SCSI int stuck error**. There is a SCSI chip failure.	▪ Make sure the autoloader is not being used by any host, then press RESET on the operator panel. ▪ If the error persists, contact your service provider or Exabyte Technical Support. You may be asked to supply a diagnostic listing; you may need new firmware or a new controller card.
194	**All slots are full**. All data cartridge magazine slots contain a cartridge.	This error only appears when you are performing a demo. Remove at least one cartridge from the magazine.
195	**All slots are empty**. All data cartridge magazine slots are empty.	This error only appears when you are performing a demo. Insert at least one data cartridge into the magazine.

Error no.	Description	Corrective action
197	**Tape in drive can't move**. Command cannot be executed because there is a cartridge in the tape drive.	Remove the cartridge from the tape drive and reissue the command.
198	**CHM full before move**. There was a cartridge in the robot before a move operation, initialize element status, or diagnostic test.	▪ Remove the magazine and look for anything that might be obstructing the robot. ▪ Make sure the autoloader is not being used by any host, then reset the autoloader from the operator panel. If necessary, power the autoloader off, wait 10 seconds, then power it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider. You may be asked to supply a diagnostic listing, and you may need new firmware.
199	**Remove tape in drive**. The cartridge must be removed before the autoloader can begin its POST.	Remove the cartridge from the tape drive.
210	**Remove all tapes for calib**. All cartridges must be removed so the autoloader can begin calibration.	▪ Remove the magazine (it is unlocked). ▪ Remove cartridges from all the magazine slots, the tape drive, and the picker. ▪ Replace the magazine. The autoloader will automatically calibrate.

Error no.	Description	Corrective action
211	**Eject sensor error.** There is a bad sensor or the autoloader cannot communicate with the tape drive over the serial interface and there is a cartridge protruding from the tape drive.	▪ Make sure the autoloader is not being used by any host, then reset the autoloader and the tape drive by powering the autoloader off, wait 10 seconds, then powering it on again to reset the tape drive. **CAUTION:** Wait at least 10 seconds between powering the autoloader off and turning it back on again to allow the tape drive sufficient time to complete its reset operation. ▪ If the error persists, contact your service provider.
212	**Remove tape in robot.** A cartridge was in the robot during POST.	▪ Remove the magazine (it is unlocked). ▪ Remove the cartridge from the robot and place it in the magazine (if you know where it goes). ▪ Replace the magazine. The autoloader automatically resumes post.

Notes

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Contacting Exabyte

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Exabyte Technical Support	1-800-445-7736
	1-303-417-7792
	1-303-417-7160 (fax)
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World Wide Web	www.exabyte.com www.mammothtape.com www.m2wins.com
To order supplies and accessories	
Exabyte	1-800-774-7172 or 1-800-392-8273
To return equipment for service	
Exabyte Service	1-800-445-7736
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